THE

AMERICAN JOURNAL OF PHARMACY.

JULY, 1854.

AMERICAN PHARMACY.

By Edward Parrish.

Continued from page 217.

In considering the best plan for organizing the profession of Pharmacy, we are met at the outset with the fact, that from the first suggestion of an extended organization, two different views have been entertained, one looking toward the formation of local societies, colleges, &c., which should be duly represented in a national congress, whose members generally should be accredited as delegates; and the other proposing the immediate union of all well-disposed pharmaceutists into a national association, without regard to location or previous organization, the influence of which should be exerted for the improvement of Pharmacy throughout the whole country, and, as fast as circumstances would allow, in promoting the organization of local societies on the same general plan and with similar objects in view.

The origin of the first convention accounts in part for the prevalence of the first named view. The discrepancies occurring at the different ports of entry in the administration of the law for the inspection of imported drugs and medicines, led to a united action of the different incorporated colleges of pharmacy, to endeavor to fix standards of purity for the various leading medicines passing through the custom houses, and thus, as far as these legally authorized institutions could influence the policy of the different special examiners of drugs, to produce the uniformity of action among them that would be desirable. For this object, involving as it did many delicate questions requiring knowledge and experience to settle them aright, and in which grave differences of opinion would be sure to arise, and the sanction of majorities, pro and con, be sought, and in which a sort of official force was designed to be imparted to the decisions, there were strong reasons for requiring that the conventions should consist of carefully selected representatives from established societies.

The object and scope of the American Pharmaceutical Association was, from the first, widely different from this. In the Philadelphia College of Pharmacy, where the idea of such an organization originated, it was proposed, at the time of selecting delegates to the convention in New York for the above purpose, that the delegates should suggest holding a convention at a future day, with a more general object in view—a convention in which all well-disposed druggists should enjoy an opportunity to mingle and compare sentiments upon their common duties, responsibilities and interests, and originate plans for the improvement of their art and the advancement of their professional interests.

The convention of 1851, in New York, entertained this proposition, and issued an invitation confined to delegates from existing pharmaceutical organizations to attend, in the following year, in Philadelphia; but the convention of 1852, as soon as the question of organizing came before it, evinced a wider and more liberal spirit, adapted to the more extended field of labor which seemed opening before it, and, as a result, adopted the present section of the constitution relating to members.

And yet this section must be regarded as a sort of compromise between the more progressive and ultra conservative ideas of members. For although, *practically*, it seems to have opened the door to all rightly disposed pharmaceutists to enter the organization by pursuing the rather awkward and sometimes difficult preliminary steps laid down, yet in the Code of Ethics, which is made a test of admission to membership, a clause is inserted which would, if *strictly construed*, keep out some of the most interested and efficient members. The obligation "to discountenance quackery," although one which will certainly be increasingly felt by members as they become imbued with the prevailing spirit of the association, has never impressed itself as a duty upon many whose aid we desire to invoke in our earliest efforts. It is mainly by the sale of quack medicines that many druggists subsist, who yet desire a reform in their business, and would be glad to co-operate in the laudable objects of the association. In view of these considerations the writer is led to advocate a cordial welcome into the association of all druggists, apothecaries and chemists who desire self improvement, and are willing to identify themselves with the general progressive movements

growing out of such an association. Let us abolish all tests of membership, and trust to the force of sound principle and the contagion of good example to spread through our ranks a higher and better standard of practice.

By the more complete incorporation of the popular element into the national organization, we may hope to extend its usefulness to localities which would otherwise be unrepresented at its meetings. We shall be able to extend the system of regular apprenticeships throughout the west, and, through the employers to incite in apprentices a disposition to advance their own interests and those of the profession at large by higher scientific attainments and more thorough practical training. The Pharmacopœia, as a standard of practice, we may hope will be more generally used. The petty jealousies that keep apart those whose interests are similar, may be expected to melt away, in great measure, before the "esprit de corps" which the Association will seek to foster and maintain, and the diffusion of theoretical and practical knowledge by the reading of prize essays and the discussion of scientific and business topics at the meetings will be more widely useful in proportion as the doors are thrown open to all who are disposed to join and attend upon the Association at its migratory meetings.

As the sphere of the National Association is extended, we may anticipate that the local organizations, which were sought in the first instance as a primary object, will gradually take place as a secondary result, and these growing out of the parent stem, will be more completely assimilated to it and to each other, than as though independently organized each on its own basis.

If the twenty-five towns in the United States, which have at least ten druggists and apothecaries, were each to contain a Pharmaceutical Society auxiliary to the National Association, the influence of the profession of Pharmacy would soon be felt over the entire country.

The organization of druggists, chemists and apothecaries into local societies, however small, is then an object of the highest utility, and one to be kept constantly in view. The most potent motive for organization would be found in self-interest. There is scarcely a town in which a united effort of the druggists, might not so elevate the character of the trade as to make the business

of *all* more lucrative and more respectable, without materially abridging the independence of *any*.

The evils of unrestrained competition and want of united action, seriously affect the profits of our business. 1st. In the undue reduction of prices, the greatest bane of Pharmacy. 2d. In the sale of quack medicines, in place of standard preparations of our own manufacture. 3d. In the failure to secure from physicians a due regard to the rights and immunities of apothecaries.

Suppose a half dozen druggists, who supply a town and its vicinity mainly with medicines, to enter in good faith into a compact to keep up, or, if necessary, to elevate the standard of prices, so as to be amply remunerative, adding to this, a determination to compete with each other only in the improvement of the character of the business. The advantage would soon be experienced by the public in an improved Pharmacy; physicians would find it expedient to give up the preparation of medicines to those to whom it legimately belongs; the sphere of each qualified Pharmaceutist would be extended, the business would begin *to pay;* quack medicines would be found less profitable to deal in than the standard preparations, and the public mind would soon begin to yield to the united and steadily directed effort of the apothecaries, and the physicians, their powerful allies, in turning back the tide of quackery. New demands would soon grow up, in supplying which, new sources of profit would arise, and ultimately the desire for self improvement, if not the necessity for it, would lead to a closer and more effective union, which would find in the great national organization occasion to affiliate with other and longer established Associations.

Let us not then begin by measures calculated to arouse the prejudices, or wound the interests of any. Let us not too much despise self-interest as the strongest motive we can invoke to draw together those we seek to unite. Once present this motive in all the force of which it is capable, and organization, both local and national, will be the result. From this organization alone, we may expect to grow those extended and philanthropic views and measures which will challenge the respect of the nation at large, and give character and influence to the *Profession of Pharmacy.*

EXAMINATION OF IODIDE OF POTASSIUM.

By J. M. Maisch.

Having lately had opportunity of testing the purity of various parcels of iodide of potassium, I deem it proper to state the result of these investigations, and at the same time to call attention to a very easy way of determining very nearly the purity and value of this salt; not only the present high price of it may justify the publication of this paper, but still more so its high value and extensive use by practitioners, and its liability to adulteration, against which to put the apothecaries on their guard is the object of these lines.

Several years ago Marozeau proposed to ascertain the purity of iodide of potassium by dissolving 5 grs. of it and two grs. of corrosive sublimate—that is two equivalents of the former and one of the latter—separately in about 3 oz. of distilled water, and dropping the last into the first solution until a red tinge is produced which does not disappear after stirring well with a glass rod; comparing the quantity of the solution left with its original quantity indicates the purity of the iodide. In this process the iodide, as will be seen by reference to some table of weights of the equivalents, just suffices to dissolve the formed biniodide of mercury ($2\,KI + Hg\,Cl = KI, HgI + KCl$,) and consequently no precipitation can take place, if the first article is chemically pure, the commercial corrosive sublimate in general being pure. As soon as on the addition of the last, that iodide necessary for keeping in solution the binodide of mercury, is decomposed, a red tinge appears, owing to the separation of the mercurial iodide.

Thinking that thus easily within a fraction the per centage of impurities might be found, I have altered a little the above quantities. In the following examinations I have dissolved 10 grs. of iodide of potassium in about 2 oz. of water, and 4 grs. of the corrosive sublimate in exactly 2 oz. 2 scr. (1000 grs. troy) of water. The weight in grs. of the solution of corrosive sublimate left after the reddish tinge appears expresses very nearly the amount of impurities present in 1000 parts of the examined sample. The annexed table shows the purity of several different articles of odide of potassium ascertained in the above way:

Iodide of Potassium.	Solution of Corr. Sub. left after the examination—grains.	Percentage of Pure Iod. of Potass.	Impurities.
1. From Atkinson & Biggar, London	0	100	0
2. Sold as an English article	45	95.5	4.5
3. do. Large crystals	52	94.2	5.2
4. Same bottle, smallest crystals	248	75.2	24.8
5. French from Conrad, Paris	144	85.6	14.4
6. The same	155	84.5	15.5

In order to find the amount of chloride of potassium, the presence of which was shown by tests, of the specimens No. 3 and 4, 100 grs. were precipitated by nitrate of silver, the precipitate treated with ammonia and the filtered liquor neutralized with nitric acid, to separate the chloride of silver. Thus it was obtained of

No. 3. 134 grs. AgI, and 3 grs. Ag Cl, corresponding with 94.72 per ct. K I, 1.57 KCl.
4. 99 " 16 " 69.75 " 8.32

The chloride found is but a fraction of the amount of impurities, therefore some other body must be present. I have satisfied myself about the absence of carbonates, but could not proceed any further as the article was returned to the vender. It is proper to state still further that the small crystals were very damp; some of them lost at 80°, 2 per ct.; and at 212°, 2 more per centage of moisture, some of the large crystals at 212° not quite 1 per cent.

20 grs. of specimen Nos. 5 and 6 were precipitated by sulphate of copper under addition of sulphurous acid. The obtained protoiodide of copper weighed 19 grs. equal to 16.55 grs. or 82.75 per ct. of pure iodide of potassium. The fine unsuspicious appearance of this chemical induced me to prove the correctness of the above examinations by ascertaining directly the quantity of iodine. I have not searched yet for the nature of the impurities.

From the foregoing statements it appears that according to Marozeau's treatment invariably a larger per centage of pure iodide of potassium is found, being, however, not over 1 or 1.5 per cent. if the impurities are equally diffused among the pure iodide, and some practice enables the operator to find the right point where to stop adding the solution of corrosive sublimate. The greatest difference among the above is with No. 4, being about 5.6 per cent. which, however, seems to me can be explained by the crystals not being an even mixture of the iodide with the impurities, as can be judged from the analysis No. 3 of the

largest crystals in the same bottle mixed with very small ones analyzed under No. 4.

Now, although by the method of Marozeau the true purity of iodide of potassium can not be found, it is so very convenient on account of its simplicity and quickness, that it deserves to be recommended to the druggists for their general adoption, if they have not time to make a quantitative analysis of the amount of pure iodide present by converting it into the protoiodide of copper.

Philadelphia, June, 1854.

NOTICE OF AN ATTEMPT TO POISON WITH STRYCHNIA.

By Henry F. Fish, of Waterbury, Conn.

On the 4th of March last, a gentleman of this city brought me a small basket containing his dinner, which, he said, he had been deterred from eating, owing to the discovery of a very unpleasant bitter taste developed on biting a fried cake. The basket was wrapped loosely in a paper, and my attention was immediately called to some white grains lying near and under the bottom of the basket. On examining these, as well as the contents of the basket, with a magnifying glass, I was enabled to obtain and preserve nearly all the suspected substance, not actually absorbed by, or adhering to, the various articles of food. From the physical aspect and intense bitter taste of these small white grains, I was induced to think the suspected substance was *amorphous commercial strychnia*, combined, as that sort of strychnia generally is, with *brucia*, in just sufficient quantity to render it *chemically impure*. I employed the following means for identifying these substances.

1st. A portion of the suspected powder was boiled with water, but remained nearly, if not quite, insoluble, imparting to the water, on cooling, a slight opacity. The taste of this mixture was purely and intensely bitter, leaving upon the tongue, for many hours, a peculiar impression.

2d. A portion of the same powder was then submitted to the action of nitric acid of 44°. It was entirely dissolved, without any evolution of gas, and the mixture assumed a decided *brick red color*.

3d. A portion of the same substances, not more than one tenth of a grain, was moistened with strong sulphuric acid; to this a minute quantity of red ferro-cyanide of potassium was added, when a copious violet color, of remarkable beauty, was produced.

Again, some of the same powder was moistened with strong sulphuric acid, and a single drop of a strong solution of yellow chromate of potassa added. The usual violet color was decided and abundant, but not so striking in its effects, as in the preceding experiment.

If it be asked, which, of all these results, was the most satisfactory, I reply, all of them were decided and characteristic; but I regard the last with red ferri-cyanide of potassium, (next to the peculiar taste,) as the most decided and delicate. I should think that the violet color in this experiment, could be produced by the presence of even so small a quantity as the one thousandth part of a grain of the ordinary *commercial strychnia.*

The contents of the basket were bread and butter, dried beef, cheese, fried cakes and a small fruit pie. The cakes and beef had retained a larger proportion of the strychnia than the other articles. On examining the upper crust of the pie, some minute particles of the strychnia were readily discerned, adhering to it. The whole have been carefully sealed up and laid aside for future examination, if necessary. Judging from the quantity found in the basket and on the paper, I should think that at least ten grains of strychnia had been thrown into the basket.

The position of the basket during the forenoon of this day, the limited number of workmen have access to the workroom, with some other attending circumstances, leave no doubt upon my mind, that an attempt at sure and fatal poisoning was made, and the individual suspected has since left the country.

SYRUPUS CALCIS PHOSPHATIS.

By Thomas S. Wiegand.

In the twenty-fifth volume of the American Journal of Pharmacy, page 411, a formula for a syrup of phosphate of lime was published by Mr. A. Durand, which, being prepared by means of phosphoric acid, is so thoroughly in accordance with the chemis-

try of the salt used, that it challenges the respect of the profession; but, while so chemically correct, it has been found in practice that the free use of phosphoric acid in many cases is not unattended with disadvantage; the more so, as the class of persons intended to be benefitted by the syrup in question, cannot endure the slightest diarrhœa without being much injured.

Yet the use of the phosphates of iron, lime, soda and potash, has proven satisfactory in the hands of several of our first physicians, and, in view of these facts, it was thought that a formula avoiding free phosphoric acid might be of use:

℞. Calcis phosphatis precip.	℥j.
Acidi chlorohydrici	f.℥iv.
Aquæ q. s. ft.	f ℥vii.
Sacchari q. s. ft.	f.℥xiiss.

Dissolve the phosphate of lime, previously mixed with an ounce of water by means of the acid, filter, then add the remaining water; to this add the sugar, until the bulk is increased to twelve fluid ounces, and strain.

SYRUPUS MANGANESIÆ PHOSPHATIS.

By Thomas S. Wiegand.

The attention of the medical profession having been called to manganese as a remedial agent, and many writers having recommended it as suitable to those cases in which the ferruginous salts were inapplicable by reason of their tendency to produce headache, it was thought that a phosphatic salt of manganese would be preferable to any other preparation, as the phosphates generally have been found advantageous in anemic conditions of the system. To be a satisfactory preparation, it should be in solution and unalterable by exposure to the air.

The following formula, combining these pre-requisites, is of such a strength that each fluid drachm contains five grains of phosphate of manganese:

℞. Sulphate of manganese (in crystals)	℥jss. gr. xvii.
Phosphate of soda	℥iiss. or q. s.
Chlorohydric acid	f.℥iv.
Water q. s. ft.	f.℥vii.
Sugar q. s. ft.	f.℥xiiss.

Dissolve the salts separately each in half a pint of water, and add the solution of phosphate of soda to the solution of sulphate of manganese as long as it produces a precipitate, which wash with cold water and dissolve by means of the chlorohydric acid; dilute till it measures seven fluid ounces, then add sugar sufficient to make up the bulk of twelve and a half fluid ounces.

Philadelphia, June 15th, 1854.

ON THE PREPARATION OF THE SYRUPS OF ORANGE PEEL, TOLU AND GINGER, AND ON THE SYRUP AND FLUID EXTRACT OF VANILLA.

By William Procter, Jr.

When an aromatic tincture, made with alcohol of sp. grav. .835, holding in solution volatile oil, resin, extractive and other principles, is suffered to evaporate spontaneously, a considerable portion of the alcohol may be separated without occasioning much precipitation of these principles. If, now, such a partially evaporated tincture be triturated with a mixture of carbonate of magnesia and sugar, and water be gradually added, the odorous and sapid principles are dissolved to a large extent, and by filtration a transparent liquid is obtained, containing but little alcohol, and which forms with pure sugar a perfectly transparent syrup, highly charged with the aroma and taste of the substances treated.

The idea of using carbonate of magnesia as an inter-medium, in preparing the aromatic waters, has long been in use, but its application to the preparation of liquids for syrups was first suggested in print by John D. Finley, (Amer. Jour. Pharm, vol. 23, page 219,) yet he makes no provision for the removal of the alcohol.

By adopting the idea above sketched forth, a number of syrups can be prepared, so as to produce their aromatic qualities in perfection.

Syrup of Orange peel.

Take of Peel of sweet oranges, recently dried,	two ounces.
Carbonate of magnesia,	half an ounce,
Sugar, in powder,	two pounds and a half,
Deodorized alcohol, and Water,	of each a sufficient quantity.

Reduce the orange peel to coarse powder, put it in a small glass percolator, and pour deodorized alcohol slowly on it till six fluid ounces of tincture have passed. Evaporate this spontaneously, or by a heat of 120° F., till reduced to one third; triturate this with the carbonate of magnesia, an ounce of sugar, and half a pint of water gradually added, as in making the officinal aromatic waters; pour the mixture on a filter, and when the liquid ceases to pass, add water till a pint has filtered. To this add the sugar in a covered vessel, dissolve with a gentle heat and strain, if necessary, through cotton flannel. Thus made, syrup of orange peel possesses all the delightful flavor of the rind, keeps well, and is superior to that made by a process previously suggested by me in the 19th vol. of this Journal, and noticed at page 1206 of the 9th edition of the U. S. Disp., and which Mr. Laidley, without being aware of it, has re-suggested at page 106 of this volume.

Syrup of Tolu.

Take of Balsam of Tolu,

Carbonate of Magnesia,	each half an ounce,
Sugar,	two pounds and a half, (troy,)
Alcohol,	a fluidounce,
Water,	a sufficient quantity.

Triturate the tolu with the carbonate of magnesia and an ounce of sugar, add first the alcohol, and then water gradually during the trituration, till the mixture measures about twelve fluidounces, and pour it on a filter. When the liquid ceases to pass, add water till the filtrate amounts to a pint. Dissolve the sugar in this by means of a gentle heat, and strain through damp cotton flannel, if required.

If the tolu is very soft, it will be best to dissolve it in the alcohol in a capsule, and then triturate it with the sugar and magnesia, and finally the water. Where the tolu is sufficiently dry to pulverize, the preparation may be made without any alcohol; but in general it is best to use deodorized alcohol, the small quantity of which is of little account.

Syrup of Ginger.

Take of Jamaica Ginger,*	four ounces,
Carbonate of Magnesia,	an ounce,
Sugar,	twenty pounds, (Troy.)
Deodorized alcohol, and	
Water,	each a sufficient quantity.

Reduce the ginger to a uniform coarse powder, pack it in a displacer, pour on the alcohol slowly till eight fluidounces of tincture has passed, evaporate this spontaneously, or at 120° F., till reduced to three fluidounces, triturate it with the carbonate of magnesia, and two ounces of the sugar, and add gradually two pints of water. Pour this on a filter, and when the liquid ceases to pass, pour on water until eight pints are obtained. Dissolve the sugar in this in a covered vessel and strain, if necessary, through cotton flannel.

It will be perceived that the proportion of ginger to syrup is larger in this than in the officinal formula. The object of this change, is to admit of the use of less alcoholic menstruum, as well as because it is believed advantageous for many of the purposes for which it is used.

Fluid Extract of Vanilla.

Take of choice Vanilla,	an ounce, (Troy.)
Sugar,	fourteen ounces, (Troy.)
Deodorized alcohol,	four fluidounces,
Diluted alcohol, and	
Water,	of each a sufficient quantity.

Cut the vanilla in short transverse slices, beat it to a pulp with two ounces of the sugar and a little alcohol, put the mixture in a small percolator, and pour gradually on first the alcohol, and afterwards diluted alcohol, till twelve fluidounces of tincture are obtained. Add two ounces of sugar to this tincture, evaporate it at 120° F. till reduced to six fluidounces; then add the remainder of the sugar and five ounces of water, or as much as is sufficient to make the whole measure a pint. Thus made, fluid extract of vanilla embodies all the aroma of the beans, and is well adapted for pharmaceutical and culinary uses.

*When desired, a pint of officinal tincture of Ginger may be used, to avoid the special preparation of the tincture, evaporating it to four fluidounces at 120° F.

Syrup of Vanilla.

Take of fluid extract of Vanilla, two fluidounces,
Simple syrup, two pints,

Mix them.

Or, if a perfectly transparent syrup is desired,

Take of fluid extract of Vanilla, two ounces,
Carbonate of Magnesia, two drachms,
Water, one pint,
Sugar, two and a half pounds, (Troy.

Triturate the fluid extract and carbonate together, add half a pint of water gradually, filter, mix this liquid with the remainder of the water, add the sugar, dissolve by aid of heat and strain.

PHARMACEUTICAL GLEANINGS.

Oil of Morphia. Insolubility of Morphia in Chloroform.—A few months ago, (Jan. 1854,) we published a short note in reference to "oil of morphia," as described by M. St. Lager, in which chloroform was the *medium* of solution. M. Lepage, (*Jour. de Pharm., Avril*, 1854,) refers to a previous article by himself, on the solvent powers of chloroform, in which it is stated that morphia and its salts are insoluble in that liquid, and then by new essays confirms his previous results, proving that M. St. Lager's process cannot be followed.

The sulphate and hydrochlorate of morphia being but slightly soluble in fixed oils at the ordinary temperature, but more so when hot, M. Lepage recommends that the mixture of almond oil and hydrochlorate of morphia, should be heated just before it is to be used.

As a substitute for the "oil of morphia," M. Soubeiran suggests a solution of morphia in glycerin, viz:

Acetate of Morphia, six grains,
Glycerin, a fluidounce.

Dissolve the morphia in the glycerin with or without heat.

Mounsey's Preston Salts.—The following directions for making this preparation, are taken from the London Pharm. Journal, viz:

Take of True oil of cloves,
English oil of lavander, of each a drachm.
Oil of bergamot, five drachms,
Strongest solution of ammonia, (sp. gr. .880) one pint,
Mix these together. The bottles are then to be half filled with rough carbonate of ammonia, and filled up with the carbonate in fine powder. The salt is then saturated with the above solution, and corked closely.

Oil of Protiodide of Iron.—M. Gille of Paris has suggested that oil of almonds may be impregnated, to a certain extent, with protiodide of iron, provided the iodine, iron filings and the oil are mixed together, and shaken till the odor of iodine disappears, which requires several days.

The following is the formula suggested:

Take of pure iodine, in powder, 34 grains,
Iron filings, 230 grains,
Oil of almonds, 25 ounces, (Troy.)

These ingredients are mixed together, and agitated occasionally for several days. The oil of protiodide of iron, when complete, has a slight amber color, no odor and almost without taste. It preserves its physical and medicinal properties for some time without appreciable alteration, and should be kept in glass stoppered bottles.

In the *Annals of Pharmacy*, from which we extract this notice, it is not stated whether M. Gille proved the presence of iodide of iron in the oil. It is probable that some reaction occurs between the oil and iodine, prior to or coincident with its action on the iron.

Nitro-tannate of Mercury.—An eminent surgeon of Bordeaux, France, recommends an ointment made of an ounce of lard, *seventy-six* grains of tannin, and *twelve* drops of acid nitrate of mercury, as an application in certain forms of syphilitic ulcerations.

Remedy for tooth-ache.—Dr. Whipple, (*Amer. Journal of Dental Science,*) recommends oil of turpentine as a remedy for tooth-ache, applied on a pellet of cotton, and covered with dry cotton. It is particularly applicable in cases where the pain results from inflammation of the nerve, or from irritation caused by wounding the pulp.

Cannabis Indica.—The curious effects attributed to the extract and other preparations of the *Cannabis Indica*, as used in Egypt, has induced the "Societé Medico Pratique de Paris" to offer a prize of one thousand francs for the best analysis of the Cannabis. The applicants for the prize are expected to send specimens of the principles they obtain, with a written memoir descriptive of the processes, &c., which must be in the French or Italian languages, and addressed to "M. Soubeiran, Secretaire General de la Societé de Pharmacie de Paris, Rue de l'Arbaleté 21" before the 1st of July, 1854.—(*Boston Med. and Surg. Jour.*)

Oleo Resin of Male Fern.—According to the *Monthly Journal*, Prof. Christison has directed attention to the ethereal oleo-resinous extract of male fern in the treatment of tape worm. Subsequently it had been tried by himself and others in twenty cases, and in no case did it fail after a single dose, to discharge the worm, and usually in one mass. The operation of the medicine, in most cases, was not attended with pain or uneasiness.

The dose varied from 18 to 24 grains; the latter has proved most effectual.

Saccharated Iodide of Iron—The Hanover Pharmacopœia gives a formula for this preparation. Sixteen parts of iodine, four of iron filings, and 62 of water are gently heated together till the solution becomes green, when it is rapidly filtered, and mixed with 48 parts of pulverized sugar of milk. This mixture is then to be evaporated by means of a water-bath, until it acquires a thoroughly dry consistence. Thirty two parts of sugar of milk are then to be added, and the whole rubbed in a mortar into a fine powder. When properly made it is a yellowish white powder, soluble in seven parts of water, and requires to be kept in closely stopped bottles. This powder contains rather less than one per cent. of iodide of iron.

Coating Pills.—In the January number of this Journal, a process was given, as suggested by M. Calloud, for coating pills with mucilage of flaxseed and sugar. The same writer in the *Jour. de Chimie Médicale* for May, 1854, suggests a new material as preferable to flaxseed and sugar:

Take of Tragacanth, in pieces,	50 parts,
Distilled water,	100 "
Pure sugar of milk, in powder,	1000 "

Make a mucilage with the tragacanth and water, squeeze it through a linen cloth as in making lozenges, mix it with the sugar of milk to form a paste, spread this on plates, dry it in a stove and pulverize it. The pills are coated by moistening their surface with water and immediately rolling them in the powder. The moisture fixes a portion of the powder on their surface, and forms a coating.

Ioduretted Oil.—Some time since, M. Deschamps proposed an ioduretted oil, as a substitute for cod liver oil, which was made by dissolving iodine in almond oil, and passing steam through the solution until it became decolorized. M. Berthé, pharmacien of Paris, suggests that when so made the oil acquires a disagreeable rancid taste, and is liable to become black by standing; and proposes the following as a substitute. Triturate seventy-five grains of iodine, with thirty-two ounces of the oil of almonds, heat the mixture in a water bath until it becomes free from color, and does not affect damp starch paper. It is not acid, but becomes so by contact with moisture. M. Berthé considers it superior to all other ioduretted oils known, on account of its less disagreeable taste and easy preparation. It does not contain all the iodine employed in its preparation. It is considered preferable to operate in open vessels, as the oil made in close vessels becomes dark by keeping.

The dose is about the same as that of cod liver oil. M. Berthé has also prepared an *iodophosphuretted oil*, and M. Renault an *ioduretted albumen*, but doubts have been expressed in regard to their usefulness as medicinal agents. For further particulars relative to all these compounds, see the "Dublin Quarterly Journal of Medicine," and "Bulletin Général de Therapeutique."

Means of removing the rancid odor of Fats.—Dr. Griseler has accidentally made the observation, that an addition of nitric ether to rancid oil entirely destroys the disagreeable smell, and that when the oil is heated to separate the alcohol, it becomes clear and bright, even when it was before turbid. Dr. Griseler says, that a few drops of this liquid will prevent sweet fixed oils from becoming rancid.

IODIDE OF SODIUM.

By the Editor.

Among the new remedies (or perhaps old remedies in new forms,) is iodide of sodium, which has been called for by several physicians in this city.

It may be economically and easily made by the following recipe:

Take of Iodine,	two ounces,
Iron filings,	an ounce,
Carbonate of Soda, in crystals,	two and a half ounces.
Water, a sufficient quantity.	

Mix the iodine with six fluidounces of water in a flask, add the iron filings, and agitate them together till the reaction ceases and all the iodine is combined; throw the whole on a filter, and when the solution has passed, wash the filter with water till the whole measures a pint. Dissolve the carbonate of soda in half a pint of water, and add it to the solution of iodide of iron, till it ceases to produce a precipitate of carbonate of iron; then heat the mixture nearly to the boiling point, filter and wash the residue on the filter with half a pint of water, and add it to the filtered liquid. Lastly, evaporate this in a porcelain capsule, till a pellicle begins to form, and set it aside to crystallize by cooling. Pour off the mother liquid from the crystals when formed, and again evaporate and crystallize.

Iodide of sodium, may also be made precisely as directed for iodide of potassium in the United States Pharmacopœia, substituting caustic soda for caustic potassa; but independent of the fact, that pure caustic soda is expensive, it is necessary in deoxidizing the iodate of soda to avoid contact of air, else there is a loss of iodine with the formation of carbonate of soda.

Iodide of sodium obtained as above, by the cooling of a hot solution, crystallizes in white anhydrous cubes. When formed by spontaneous evaporation it contains 4 equiv. of water of crystallization. The crystals are striated oblique rhombic prisms, melt when gently warmed, and on being heated lose their water, leaving dry iodide of sodium. The hydrated iodide is more stable when exposed to the air than the anhydrous salt, but is more deliquescent, and very soluble. (*Gmelin.*)

ON PREPARED CITRATE OF MAGNESIA.

By Charles Ellis.

The article which is the subject of this notice is called *Prepared Citrate of Magnesia*, to distinguish it from the soluble citrate, an account of which will be found in the American Journal of Pharmacy, vol. xxiv. page 115, by Edward Parrish.

Citrate of magnesia has within a comparatively short period of time been introduced into very general use. It is so destitute of bitterness or unpleasant taste that its preference as an aperient medicine over the nauseous potion of epsom salts is readily accounted for.

The liquid citrate which is so favorite a remedy with physicians, whenever a saline cathartic is indicated, is one of the most eligible preparations of its kind yet introduced to the notice of the faculty. It is in consequence of its popularity that enquiries have been made for an article of similar properties *in powder*.

To render the "soluble citrate" pleasant to the taste and capable of forming an effervescing solution when dissolved in water, it is necessary to combine with it sugar, and either bicarbonate of soda or potash, with the requisite quantity of citric or tartaric acid to decompose the latter.

If citric acid be used, care must be observed to dry it over a water bath, so as to deprive it of water of crystallization, previous to its combination with the alkaline bicarbonates.

The *prepared citrate of magnesia* is not recommended as equal to the *solution*, because the citrate in powder, however carefully prepared, is only slowly soluble in cold water, and does not readily make a clear solution.

When such a preparation, however, is wanted, the following formula is submitted as having been found in practice to answer the desired purpose.

The *soluble citrate* used is that made by the formula published in a previous volume of this Journal, and referred to in the first part of this notice.

Take Magnesiæ citras,	℥iv.
Sacchari pulv.,	℥viij.
Acid citric, *vel* tartaric, pulv.,	℥iiss.
Soda bicarb.,	℥iij.
Ol. Limonis,	gtt. xx.

Combine the acid and sugar, and rub into a fine powder (if citric acid is used dry all the water out over a water bath,) add the magnesiæ citras and ol. limonis, and mix intimately; then add the bicarb. of soda, and triturate the whole into a fine powder, which must be preserved in bottles properly excluded from the air. The dose for an an adult is from one to three tablespoonfuls mixed in a tumbler of water, and drank in a state of effervescence.

ON SOME DOUBLE SALTS OF IRON, AND THE RELATION OF SIMILAR SALTS TO THE ALUMS.

By Mr. William Bastick.

It will be in the recollection of many members of the Society that on a recent occasion there was a discussion as to the number and variety of double salts, properly included under the generic term *alums*. By some it was argued that only the double salts formed by the combination of persulphate of alumina, persulphate of iron, persulphate of chromium, or persulphate of manganese, with sulphate of potash, sulphate of soda or sulphate of ammonia, crystallized in octohedrons with twenty-four equivalents of water, and could therefore be regarded as alums. By others it was assumed that, besides these double salts, the term might be applied with propriety to all the combinations of the before-mentioned persulphates, with the sulphates of magnesia, manganese, iron, zinc, copper, cobalt, and nickel. This assumption, although contrary to theory, has been supported by Sir Robert Kane and others, who have described some double salts formed of these metallic and earthy sulphates, in combination with persulphate of alumina, and who have applied the term alums to these double salts, because they possessed a similar constitution to the true alums, notwithstanding that their crystalline form belonged to the prismatic system. Now, I apprehend, that for any salts to come under the generic term alums, they must be isomorphous with the salt from which the genus alone derives its name, and that to be thus isomorphous it is absolutely necessary that the salts should possess the same crystalline form, and replace each other in combination without any material alteration in their crystalline structure. If these positions be true, however much the so-called alums described by Kane and others may agree in

their chemical composition with the true alums, they cannot be regarded as, or termed alums, because their physical conformation and properties do not satisfy the conditions required by the isomorphous theory. With a view of ascertaining whether some of the metallic sulphates might, in combination with some other persulphate than that already experimented upon by Kane and others, form salts isomorphous with the true alums, I prepared and examined the following double salts of iron:

Persulphate of Iron and Sulphate of Copper.—This salt was formed by adding in equivalent proportion sulphate of copper to a solution of persulphate of iron, containing an excess of acid, and evaporatiug the mixture until a pellicle formed on the surface, when the solution was set aside to crystallize. By these means a bluish-green salt was obtained in considerable quantity, whose crystalline form could only be clearly observed by the aid of the microscope, which proved that this salt does not crystallize octohedrons, but in wart-like masses, consisting of prisms, and therefore is not isomorphous with the true alums. This salt very readily effloresces when exposed to the air; consequently it is difficult to be preserved, or to be correctly analysed, and this difficulty is increased because it is contaminated with free acid, which is not easily removed, as it cannot be crystallized except from a strongly acid solution. Notwithstanding these disadvantages I dried as far as possible a portion of the salt for analysis by subjecting it to repeated strong pressure, between the folds of bibulous paper. 2.9 grammes of this salt thus treated yielded sulphate of baryta = .95 gramme of anhydrous sulphuric acid, and 5.6 grammes gave .43 gramme of oxyde of copper and .87 gramme of peroxyde of iron, and its water was estimated from the loss. The following table will show these quantities reckoned in per cent., and also the calculated constitution of the salt:—

		Calculated.	Found.
Cu O	40	8.07	7.67
$Fe_2 O_3$	80	16.13	15.53
3 SO_3	160	32.26	32.76
24 HO	216	43.54	44.04
	496	100.00	100.00

It will be here seen that this salt has the same chemical constitution as the alums, namely, $Fe_2 O_3$, 3 SO_3 + CU O SO_3, +24 HO, but differs entirely in its crystalline structure—in fact, so much so, as not to admit of its form being derivable from, or convertible into, that of the true alums.

Persulphate of Iron and Sulphate of Zinc.—This salt was prepared in exactly the same manner as the one previously described. It crystallizes in white transparent prisms, and corresponds to the double copper salt in all its characteristics; and although it was not submitted to an exact quantitative analysis, its examination left no doubt but that it has a similar constitution to that of the persulphate of iron and sulphate of copper.

Persulphate of Iron and Sulphate of Magnesia.—This salt, prepared as the other salts, crystallized in warty masses, consisting of prisms, and corresponds to them in its chemical and physical properties.

It is evident that the number of these salts may be multiplied to an almost endless extent, and it is equally evident, if we may presume to generalize upon the facts before us, that the multiplication of these salts would serve to further prove the impropriety and inconvenience of applying the term alums to such salts, for the pseudo-alums would then greatly outnumber the true alums. It seems from the experiments of Will and Ortigosa that the number of the true alums may be increased, if it be desirable to do so, by replacing the ammonia or potash of the double sulphates of alumina, manganese, chrome, and iron, with organic bases, by which means compounds may probably be made likely to be interesting and valuable both to the physician and the pharmaceutist.—*London Pharm. Jour., June*, 1854.

MANUFACTURE AND CONSUMPTION OF QUININE IN THE UNITED STATES.

To the Editor of the Pharmaceutical Journal.

Sir,—An article in your last number on the Manufacture and and Consumption of Quinine in the United States, claims notice, from the circumstance of its appearing in a journal of so much authority as yours. In its original form of a letter to a newspaper, it would have been noticed only as an advertisement, but

as it raises a question affecting the European makers of this important medicine, I hope you will allow me space for a few observations.

The different medicinal effects of the alkaloids obtained from cinchona barks (I refer especially to quinine, quinidine, and cinchonine) deserve a more careful study than has yet been bestowed upon them, in this country at least.* Results well worth the trial might also be obtained by their exhibition in combination, as is so often practised with other medicinal substances. The barks most valued for medicinal use as such, vary greatly in their active constituents. The species which first came into notice (cinchona condaminea) is extremely rich in alkaloids, containing large quantities of each of the three above mentioned, besides their uncrystallizable modifications.

In the mean time one very important principle must by no means be lost sight of, that a practitioner should always know what he is administering, and on this ground the substitution of even a more efficacious remedy under the old name would be totally unwarrantable.

To turn then to the question of quinine as at present in the market.

I should observe that it is only the genus Cinchona, as defined by the accurate and indefatigable Mr. Weddell, which has been proved to afford any of the above-mentioned alkaloids, the genera most nearly allied, and which at first sight resemble the cinchona most closely, being apparently quite destitute of them. Of this genus the species and varieties are extremely numerous, and all investigation only brings continually new ones into view.

The "Monopoly," or best Bolivian Yellow Bark, consists of two at least, and probably three, distinct species, of nearly equal commercial value, besides an occasional admixture of spurious sorts. These species are the Cinchona Calisaya (three or four

*I beg to refer to a very laborious and valuable work published last year by M. Briquet, "*Traite Therapeutique der Quinquinia et de ses Preparationes.*" This author, however, was not acquainted with quinidine. He estimates cinchonine as one-third or one-fourth weaker than quinine, a result which he says is confirmed by observers, who have been obliged to give sixty for eighty centigrammes of cinchonine, to arrest fever which would have yielded to forty or fifty centigrammes of sulphate of quinine.

varieties,) Boliviana, and ovata, var. rufinervis. These all contain quinine, quinidine, and cinchonine, but the two latter alkaloids in small quantity. Other species present them in very different proportions, sometimes one, sometimes another forming the chief part of the febrifuge constituents. In some the bitter taste of the bark appears to be due, not to any of these, but to a curious acid, the kinovic, which, like the fatty acids, is very sparingly soluble in water, but possesses a strong bitter taste, expecially when combined with alkalies.

It is obvious that the extraction of the quinine from these barks may be much more troublesome in one case than in another; but, in the first place, *the quinine contained in them is identical in all.* I do not speak only of its giving identical results by ultimate analysis—all its chemical properties—its solubility in a certain quantity of hot or cold water, ether, alcohol, and other solvents—its behavior with different re-agents—its powers of forming the artificial tourmalines, discovered by Dr. Herapath, and of giving the other optical results which have justly gained an European celebrity for their discoverer—its physical properties of taste, form of crystal, &c., all are precisely identical, from whatever species obtained. In fact, it would be as "scientific" to question whether gold from California and from Australia were the same thing, because one was found in combination with more silver than the other, as to admit the doubts suggested by the paper to which I refer.

Secondly. No very delicate operations are required to separate these alkaloids, so as to obtain each in a state sufficiently pure for all practical purposes.

Thirdly. The tests in common use, already described in your Journal, are amply sufficient to ascertain whether the care needed to secure this result has been taken in the manufacture.

I remain, yours respectfully,

Ibid.] ROBERT HOWARD.

ON LUPULINE.

By J. PERSONNE.

Lupuline is the yellow powder so readily obtained by rubbing the catkins of hops. To this powder the peculiar properties of

the hops, their bitterness and aroma, are due. It has been investigated by D. Ives, of New York, and by Payen and Chevalier. (Also by Dr. Rudolph Wagner.)

Lupuline furnishes both volatile and non-volatile bodies to boiling water. When distilled with water, an acid and an essential oil pass over as volatile constituents. The non-volatile substances are an organic acid and nitrogenous bitter matter, both of which are soluble in water. The author has not investigated these any further.

The *volatile acid*, determined by the analysis of the salts of silver, baryta and copper, is valerianic acid, of which lupuline contains about one per cent.

The *volatile oil* is lighter than water, becomes resinified in the air, and acquires acid properties. The boiling-point rises from 284° to 572° F. By fractional distillation, the author separated it into two different oils. One boils between 302°–320° F., the other at 572° F. Both have the constitution C^{22} H^{18} O^2; they turn the plane of polarization to the right, and do not solidify at 0° F. Concentrated sulphuric acid dissolves them with a red color; they are again separated by water, and the sulphuric acid then furnishes with baryta a salt of a conjugate sulpho-acid; nitric acid converts them partly into resin and partly into valerianic acid. If let fall in drops upon hydrate of potash, they are converted into a hydrocarbon of the formula C^{10} H^8, with formation of carbonic and valerianic acids. If this hydrocarbon be deducted from the oil, C^{22} H^{18} O^2—C^{10} H^8=C^{12} H^{10} O^2, the latter expresses the valerole which Gerhardt prepared from valerianic acid. The hydrocarbon of the oil of hops, however, furnishes no Borneo camphor, and it also has a smell more like that of thymene.

The large quantity of resin contained in lupuline renders it difficult to obtain valerole from it. The solid resinous mass left after exhaustion with water consequently still contains much of this substance. If it be distilled with lime, taking care that it is not carbonized, Chancel's aldehyde of valerianic acid goes over; its composition is C^{10} H^{10} O^2. It boils at 194° F., and is rendered brown and resinous by potash, and very readily reduces salts of silver. Its specific gravity was 0·8009 at 68° F.—*London Chem. Gaz.* from *Comptes Rendus.*

ON THE OIL OF OSMITOPSIS ASTERISCOIDES.

By E. Von Gorup-Besanez.

Martius received from Cape Town an oil denominated "essential oil of *Osmites Bellidiastrum*," accompanied by a specimen of the plant from which it had been obtained. This plant was determined by Schnitzlein to be *Osmitopsis asteriscoides;* it belongs to the family of Senecioid *Compositæ*.

The oil is a thin fluid, yellow, with a tinge of green; it feels rough between the fingers, has a penetrating but not unpleasant odor, something like camphor and cajeput-oil, and a burning taste, somewhat acrid in the throat; it is neutral. Its specific gravity at 62°·15 F. is 0·931. It is insoluble in water, ether and alcohol; iodine dissolves in it without explosion; concentrated sulphuric acid gives it a brown color; nitric acid thickens the oil, and produces a violent evolution of NO^4. Potassium becomes oxidized in it, with a slight evolution of gas. It furnishes no metallic speculum with an ammoniacal solution of silver, nor does it form a crystalline compound with alkaline sulphites. It is free from sulphur.

It began to boil at 350° F.; the boiling point then rose to 354° F., and afterwards, between 370° and 404° F., a yellowish oil passed over; at 404°–408° F. a crystalline sublimate was formed in the neck of the retort.

The oil which passed over between 354° and 370° F. possessed a much finer odor than the original oil. A portion obtained by rectification, which boiled between 354° and 362° F., was analysed. Its spec. grav.=0·921.

The oil of the *Osmitopsis* is $C^{20}\ H^{18}\ O^2$, and consequently isomeric with Borneo camphor, cajeput oil, &c., a relationship which Martius had already suspected. Analysis gave:—

Carbon . .	77·36	20 =	120	77·92
Hydrogen . .	11·53	18	18	11·69
Oxygen . .	11·11	2	16	10·39

London. Chem. Gaz., from *Ann: der Chem. und Pharm.*

PATENT GRANTED TO F. M. LYTE, FOR IMPROVEMENTS IN OBTAINING IODIDE OF POTASSIUM, WHEN TREATING CERTAIN METALS.

This invention consists in the discovery, that when the chlorides, or some soluble salts of certain metals are placed in contact with solutions containing mixed iodides and chlorides, double decomposition ensues, and insoluble metallic iodides are formed, and that, by continuing the addition of the chlorides, this continues so long as any soluble iodide remains in the solution; also that the insoluble iodide can afterwards be converted into a metal and a soluble iodide by any of the processes in use at present for the decomposition of metallic chlorides, as in refining silver. For instance, the patentee refines silver, and at the same time produces iodide of potassium from such solutions as bittern, or matters which contain these mixed iodides and chlorides. Having dissolved the silver in nitric acid, and precipitated it with a soluble chloride, as chloride of silver, he divests it of copper by washing with water. He then projects the chloride so produced into the solution of mixed chlorides and iodides, and continues the addition, with frequent stirring, till, on adding a portion of the chloride of silver to a test-sample of the liquid, it ceases to become yellow. Then, to ensure all the silver being converted into iodide, he adds a very small portion more of the mixed salts, so that there may be a small excess of iodine in the solution, rather than a trace of chlorine in the precipitate. The addition of ammonia facilitates the decomposition; so also does heating the liquid. The iodide of silver thus produced is converted into iodide of potassium and metallic silver by projecting it when completely desiccated, into a crucible containing fused carbonate of potash, according to the method now in use for the reduction of the chloride; but by this process iodide of potassium is formed, instead of the chloride as formerly,—a valuable product, instead of a product of little value.

By adding a soluble salt of lead to the mixed salts till all the iodine is precipitated, and decomposing the iodide thus formed by the same method, iodide of potassium is formed, which may be dissolved and purified by recrystallization.

The periodide of mercury (a most splendid pigment) is pro duced by adding the bichloride of mercury to the mixed salts.

By these methods all the iodine is recoverable from the mixed salts; whereas by the old process generally used, a great deal was lost as chloride of iodine.—Sealed July 26, 1853.—*London Chem. Gaz. April* 15, 1854.

CONTRIBUTIONS TO THE HISTORY OF THE FATTY BODIES.

By J. Lefort.

In a former memoir, the author communicated his views on the composition of the fatty vegetable oils, and their behaviour with iodine, chlorine and bromine. He has since endeavored to ascertain whether these elements do not act specially upon one of the constituents of the oils, as, for example, upon the oleine, rather than upon the margarine and stearine. He has arrived at the following results:—

Iodine, whose only action upon the fatty oils consists in depriving them of a very small portion of the hydrogen, does not appear to affect the oleine in any greater degree than the margarine and stearine. Chlorine and bromine, on the contrary, combine very readily with all three principles.

These new compounds are heavier than water; chlorinated and brominated oleine are thicker than pure oleine, whilst the corresponding compounds of margarine and stearine do not possess so much consistency as the pure substances, and fuse at a much lower temperature. No reagent shows the presence of free bromine and chlorine in these compounds.

Stearine, margarine and oleine, under the influence of chlorine and bromine, lose the same quantity of hydrogen, which in the case of the first, the only one of which the exact composition is known, is 4 equivs. The author gives the formula C^{76} H^{66} Cl^4 O^8 for chlorinated stearine, and for brominated stearine C^{76} H^{66} Br^4 O^8. In the case of margarine and oleine, also, the chlorine and bromine would likewise displace 4 equivs. of hydrogen.

The author has also instituted some experiments on the action of the haloid elements upon the fatty acids.

Iodine has no action upon the fatty acids produced by the saponification of either the vegetable or animal oils. Chlorine and bromine also form no peculiar compounds with stearic and margaric acids if these be completely freed from oleic acid;

small quantities of the elements are dissolved by the fatty acids, but no hydrochloric or hydrobromic acids are produced. Oleic acid, on the contrary, is readily acted upon, and furnishes the following compounds:—

Chlorinated Oleic Acid.—It is liquid at ordinary temperatures, heavier than water, and possesses a very strong brown color; it produces no precipitate with nitrate of silver. Its consistence is a little greater than that of the pure acid; its specific gravity, at a temperature of 46° F., is 1·082; it boils at 374° F. Its formula is $C^{36}\ H^{32}\ Cl^2\ O^4$.

Brominated Oleic Acid.—This possesses about the same consistence as the preceding; its color is a darker brown, although reagents give no sign of the presence of free bromine when it has been well washed and not kept too long. Its specific gravity at a temperature of 45°·5 F., is 1·282; it boils at 392° F. Its analysis gave numbers agreeing with the formula $C^{36}\ H^{32}\ Br^2\ O^4$.

The author considers that stearine and margarine belong to the class of isomeric compounds, and that the vegetable fatty oils are compounds in definite proportions of oleine and margarine, or perhaps rather oleo margarates of glycerine, the resolution of which may be affected by the most feeble agents.—*London Chem. Gaz., from the Comptus Rendus*, xxxvii., p. 28.

ON THE NITRATES OF IRON.

By S. Hausmann.

The author has carefully investigated Schönbein's nitrate of iron in Fresenius's laboratory. The acid nitrate of iron was prepared by evaporating the reddish-brown solution of iron in nitric acid to the consistence of a syrup, and then adding half its volume in nitric acid. The crystals which form are—

Neutral Nitrate of Iron, $Fe^2\ O^3$, $3NO^5+12HO$.—Prismatic crystals, fusing at 95° F. Ordway (Chem. Gaz., vol. viii. p. 61) gave the formula $Fe^2\ O^3$, $3NO^5+18HO$ for it. Analysis:—

$Fe^2\ O^3$ . .	21·47	1 =	80	22·85
NO^5 . . .	46·78	3	162	46·29
HO . . .	31.75	12	108	30·86

When the very concentrated solution of nitrate of iron is mixed with as much water as will reduce its dark red color to a

pale reddish-yellow, boiled and mixed, after cooling, with nitric acid, we obtain the

Basic Salt, $8Fe^2O^3$, $2NO^5$, 3HO, in the form of an ochre-yellow precipitate, which is difficult of solution in cold dilute acid, but dissolves readily in water, forming a deep red fluid. The salt, washed with water, containing nitric acid, furnished on analysis—

Fe^2O^3 . .	81·92	8 = 640	82·58
NO^5 . . .	14·47	2 108	13.93
HO . . .	3·61	3 27	3·49

Basic Salt, $36Fe^2O^3$, NO^5+48HO.—When the concentrated solution of nitrate of iron, containing a little excess of acid, is boiled for a considerable time, a precipitate resembling the preceding is formed; its analysis gave—

Fe^2O^3	85·44	36 = 2880	
NO^5	1·61	1 54	
HO	12·95	48 432	

Basic Salt, $8Fe^2O^3$ NO^5+12HO, was obtained by treating an excess of iron with nitric acid; it forms a rust-colored precipitate, which is difficult of solution in nitric acid, but dissolves more readily in water. Its analysis gave—

Fe^2O^3 . .	80.33	8 = 640	79·81
NO^5 . . .	6·19	1 54	6·73
H . . .	13·48	12 108	13.46

London Chem. Gaz., June 1, *from Ann. der Chem. und Pharm.*

ON THE PREPARATION OF DAMMARA VARNISH.

By W. Munsel.

If dammara resin be dissolved in cold oil of turpentine, a milk-white turbid varnish is obtained; this turbidity, however, does not depend upon the incomplete solution of the resin, but rather upon the moisture adherent to it. This moisture, as well as the water enclosed in the interior of the resin, especially in the white opake pieces, produces many defects in the varnish, as when it is prepared cold this water remains in it in a finely-divided state. When such a varnish as this is laid on, the water contained in it, although in such small quantity, can neither evaporate nor soak into the varnished object; and thus these

minute water-bubbles produce a dull, rough appearance on the surface of the varnish, so that the latter can never produce a truly glass-like coating. At every change of temperature, these watery particles either expand or contract, until at last, from frequent repetition of this process, or in consequence of a greater elevation of temperature than usual, the coat of varnish bursts or cracks, and falls off as a scaly powder. In order to get rid of this defect entirely, the water adherent to the resin must be completely removed. This is best done by boiling the resin with the oil of turpentine in an open vessel, as in this case the water enclosed in the resin is dissipated below the boiling point of the oil. The object is equally attained when the resin is well dried in a drying oven before solution, and then dissolved in cold oil of turpentine; if the resin were sufficiently dried, a perfectly clear and transparent varnish is obtained, possessing all the properties of a good varnish; this mode of preparation, however, from its complicated nature, is not to be recommended for adoption on the large scale. If a very small quantity of water be added designedly to a perfectly clear and well-boiled varnish, and the whole is shaken, the latter immediately acquires the turbid appearance, and all the properties of a bad varnish.

In the preparation of dammara varnish, the author employs enamelled cast-iron pots, capable of containing about 50 lbs.; in these, 25 to 30 lbs. of varnish may be conveniently prepared. The dammara resin is put into the pots in a solid state (the powdering of the resin is disadvantageous, as when in this state it forms a mass during the fusion, and the varnish thus generally acquires a color), the proper quantity of turpentine (5 parts to 4 parts of resin) is then poured to it, and the whole put upon the fire. As soon as the boiling of the oil begins, the water originally included in the resin is dissipated in the form of vapor, and the resin acquires a softer consistence. When all the water is expelled and the oil (or varnish) boils quietly, the solution is completed, and the vessel may be removed from the fire. As long as even traces of water exist in the varnish, its boiling is attended with a bubbling movement; but as soon as all the water is got rid of, the varnish boils quite quietly. That even a very small quantity of water is sufficient to produce this bubbling, may be shown by blowing with the mouth into some quietly-boil-

ing varnish, when the mass immediately appears ready to boil over, entirely in consequence of the slight moisture introduced into it by the breath.

When the varnish is prepared, it is poured through a fine wire sieve, and then allowed to settle sufficiently. Filtration through pointed bags, as recommended by Miller, appears to the author to take up a great deal too much time, is unquestionably attended with loss, and does not lead to the desired object so well as standing quietly.

By this method, two workmen in the author's factory prepare 4–5 cwts. of good varnish per day.

If it be desired to give the varnish a tougher consistence, 2–3 per cent. of good bleached linseed-oil (not boiled with oxide of lead) must be added to it before boiling. This communicates great toughness to it, and it then resists friction, &c. much better.—*Ibid, from Polytechnisches Centralbl.*, 1854, p. 168.

ON THE PREPARATION OF IODIDE OF POTASSIUM.

By A. Overbeck.

The author gives the following prescription for the preparation of iodide of potassium :—

Iodide of formyle is prepared from 3 equivs. alcohol, 6 equivs. iodine, and 5 equivs. potash. If 4 equivs. of iodine be employed to $C^4 H^6 O^2$, the mass thickens too much by separation of the iodide of formyle produced, so that the greater addition of alcohol is very essential to the facilitation of the operation. This is performed in the following manner :—

The necessary quantity of watery alcohol ($C^4 H^5 O, HO$) is first gently heated in a beaker or flask; the dry iodine and the potash (the latter dissolved in as little water as possible) are then alternately added, in such a manner that before each addition of iodine the solution is completely decolorized. The iodide of formyle produced separates for the most part during the operation in citron-yellow laminæ; its complete separation is effected by pouring over it 20 times as much water as there was alcohol employed; the whole is then collected on a filter, pressed between blotting-paper, and boiled with solution of potash (1 equiv. of

iodide of formyle to 4 equivs. potash) until it is completely decomposed into formiate of potash and iodide of potassium.

This fluid, mixed with that filtered from the iodide of formyle, is now evaporated to dryness, then mixed with some powdered charcoal (for the more ready decomposition of any iodate of potash that may have been formed), and heated to redness; the mass, which contains iodide of potassium and carbonate of potash, is then extracted either directly with alcohol, or with water after neutralization by hydriodic acid. Pure iodide of potassium is obtained by crystallization from either of these extracts.—*Ibid, from Archiv der Pharm.*, lxxvii. p. 8.

COCOA NUT OIL A SUBSTITUTE FOR COD LIVER OIL.

From experiments made by Dr. T. Thompson, on the effects produced upon the human system in disease by the administration of cocoa nut oil, he is led to believe that it may prove to be a very efficient substitute for cod liver oil. He has communicated the results of his experiments in a paper lately read before the Royal Society, entitled, "On Changes produced in the Blood by the Administration of Cod Liver Oil and Cocoa Nut Oil," in which he states, that the use of almond oil, and of olive oil, was not followed by any perceptible remedial effects; whereas, from the cocoa nut oil, results were obtained almost as decided as from cod liver oil; and, therefore, he believes the former oil may hereafter prove to be a most useful substitute for the latter oil. The cocoa nut oil he employed was a pure cocoa oleine, obtained by pressure from crude cocoa nut oil, as expressed in Ceylon and the coast of Malabar, from the dried cocoa nut kernels, and refined by being treated with an alkali, and then repeatedly washed with distilled water. This oil burns with a blue flame, thus indicating a comparatively small proportion of carbon in its constitution. It is being brought forcibly beneath the notice of medical practitioners, as may be seen by announcements of it in the many periodicals, specially devoted to the communication of medical and therapeutical intelligence; nor is this surprising, when the very large consumption of cod liver oil, for which this is proposed as a substitute, is taken into account.—*Annals of Pharmacy, June*, 1854.

ON THE MANUFACTURE OF CITRIC ACID, CITRATE OF LIME, CITRATE OF BARYTA, &c.*

In the ordinary method of manufacturing citric acid, lime-juice is saturated with chalk, and the insoluble citrate of lime, thus formed, is decomposed by sulphuric acid; citric acid is thus set at liberty. In this process the mucilaginous and other organic matters contained in the lime-juice, are to a great extent precipitated with the citrate of lime. These foreign matters, on the subsequent decomposition of the citrate of lime by sulphuric acid, contaminate the solution of citric acid obtained, and render it necessary for the manufacturer to have recourse to a great number of crystallizations, in order to procure the whole of the citric acid in a marketable state.

In order to destroy much of this mucilage and other organic matter, it has been recommended to bleach the washed citrate of lime by exposure in shallow vessels to the action of the sun's rays, covered by a weak solution of chloride of lime. In a few hours, it is stated, decoloration takes place, with the destruction of much of the foreign matter previously mixed with the citrate, and thus much of the after labor and expense of repeated crystallization is saved to the manufacturer.

Dr. Price's new process consists in combining the citric acid contained in lemon or lime-juice, or other impure solution of citric acid, with potash, soda, or ammonia, so as to obtain *soluble* citrates, and after separating any insoluble impurities which may be present, or which may rise in neutralization from the said neutral solution by filtration or decantation, he decomposes the said solution with salts of lime, baryta, or strontia, so as to obtain pure or nearly pure citrate of lime, or citrate of baryta, or citrates of strontia, and ammonia, or salts of ammonia, or salts of potash or of soda. The citrate of lime, or citrate of baryta or strontia, is decomposed by sulphuric acid in the usual manner, the citric acid crystallized, and the ammonia, or salts of ammonia, or salts of potash or of soda, contained in the solution from which the citrate of lime has been precipitated, may be recovered by crystallization or otherwise.

The mode of procedurein carrying out this process is as follows:

* By the Editor of the London Pharmaceutical Journal.

Into crude lemon or lime-juice, or other solution containing citric acid, the volatile compounds contained in gas-liquor are distilled until the said juice or solution is neutralized, or the said juice or solution is neutralized with gas-liquor, or with ammonia or its carbonates, or with sulphides of ammonium, obtained as hereafter described; and the neutralized solution, being filtered from the insoluble impurities, the solution of citrate of ammonia thus obtained, is decomposed in the following manner:—The solution is placed in a distillatory apparatus, and to it there is added 150 parts by weight of carbonate of lime, powdered, and made into a paste with water, or 90 parts by weight of lime slacked, and made into milk of lime, to every 192 parts by weight of citric acid existing in solution as citrate of ammonia. Heat is then applied, and the said solution of citrate of ammonia is decomposed into citrate of lime and into carbonate of, or free, ammonia, which may be conducted into a fresh quantity of lemon or lime-juice, or other solution containing citric acid, so as to neutralize the same, which solution, when neutral, or better when alkaline, may be treated as last described. The citrate of lime, thus obtained, is to be decomposed with sulphuric acid, as is now done in the ordinary manufacture of citric acid, and the solution of the liberated citric acid filtered from the sulphate of lime, evaporated and crystallized. The solution of citrate of ammonia, obtained as first above described, may be treated with either chloride of calcium or sulphate of lime. For this purpose the solution of citrate of ammonia is boiled with either of the salts of lime, viz., chloride of calcium or sulphate of lime, until the citrate of ammonia, previously existing in solution, is decomposed, and citrate of lime and either sulphate of ammonia or chloride of ammonium obtained, the decomposition of the said citrate of ammonia being conducted in the same manner and with the same precautions as after described, with reference to improvements in the manufacture of tartaric acid.

The solution of citrate of ammonia, obtained as first above described, may be decomposed with sulphide or sulphides of calcium, or soda waste (oxysulphide of calcium,) or sulphide of barium, or of strontium, the said solution being contained in a distillatory apparatus, and the decomposition being conducted in the manner before described.

The citric acid existing in lemon-juice, or other solution, may be combined with potash or soda instead of ammonia, and the

resulting solution of citrate of potash or soda be decomposed with either salts of lime or baryta, as follows:—The lemon or lime-juice, or solution containing citric acid, having been placed in a convenient vessel, a solution of sulphide or sulphides of potassium is added, with application of heat, until the whole of the citric acid is converted into citrate of potash, which may be known by the solution becoming neutral or slightly alkaline. The solution of citrate of potash thus obtained, being filtered from the insoluble impurities and placed in a suitable vessel, is decomposed by means of sulphate of lime or a solution of chloride of barium or chloride of calcium, or of nitrate of lime, or of nitrate of baryta, or chloride of strontium, or nitrate of strontia, in a manner similar to that at present adopted for decomposing tartrate of potash by means of sulphate of lime or chloride of calcium in the manufacture of tartaric acid. The citrate of lime thus produced, may be separated by decantation or filtration, and the solution containing the salts of potash, viz., either chloride of potassium, nitrate of potash, or sulphate of potash, evaporated in a convenient evaporating vessel. The salts of potash, thus obtained, if mixed with any impurities, may be recrystallized, so as to be rendered marketable.

In employing the salts of lime or baryta to decompose citrate of potash, citrate of soda or citrate of ammonia, solutions either saturated or partially so may be employed, or sulphate of lime in small crystals or powder may be used in the following proportions: viz., to every 192 parts by weight of citric acid, previously existing in lemon-juice or lime-juice, or contained in other solutions, and now existing as citrate of potash, citrate of soda, or citrate of ammonia, there may be added in parts by weight as follows:—246 parts of nitrate of lime, or 318 parts of nitrate of strontia, or 168 parts of chloride of calcium, or 240 parts of chloride of strontium, or 390 parts of nitrate of baryta, or 312 parts of chloride of barium, actually contained in solution or otherwise, or 258 parts of sulphate of lime.

Dr. Price also employs sulphide or sulphides of sodium to neutralize citric acid. This may be employed in a manner similar to that described for saturating citric acid with sulphate of potassium, and after having separated by decantation or by filtration the insoluble impurities, he decomposes the said solution of citrate of soda with sulphate of lime, in a manner similar to

that described for decomposing citrate of potash with salts of lime, and with the same amount of sulphate of lime as there employed. The citrate of lime produced is separated, and the sulphate of soda existing in solution may be obtained by evaporation and crystallization.

The salts of baryta, strontia, and lime, which are to be employed in decomposing citrate of potash, may be employed to decompose citrate of soda, and may be employed in a similar manner and in the same proportions as when employed to decompose solutions of citrate of potash. The citrate of lime and citrate of baryta or strontia resulting, may be decomposed by means of sulphuric acid in the same manner as citrate of lime is now decomposed in the manufacture of citric acid, and citric acid be therefrom obtained. The sulphide of potassium and the sulphide of sodium employed, may be obtained by heating a mixture of either sulphate of potash or sulphate of soda with small coal, coal-dust, or powdered charcoal, in a reverberatory furnace, or otherwise, until the whole or the greater proportion of the sulphate of potash or sulphate of soda is reduced and converted into sulphide of potassium and sulphide of sodium. These sulphides being soluble in water, they may either be employed in solution, or the fused mass may be used direct, or these sulphides may be obtained from other sources.—*London Pharmaceutical Journal, Jan.* 1854.

MANUFACTURE OF TARTARIC ACID, PURIFIED BITARTRATE OF POTASH, BIOXALATE OF POTASH, TARTRATE OF SODA AND POTASH, AND CARBONATES OF SODA AND POTASH *

In the ordinary mode of obtaining tartaric acid, the excess of acid, existing in crude bitartrate of potash (argols and tartar) is neutralized with chalk, with the formation of insoluble tartrate of lime and soluble tartrate of potash. The latter salt is then decomposed by the agency of sulphate of lime, and a further portion of tartrate of lime is thus formed. In this case, as in that of the citrate of lime before mentioned, much of the organic coloring matters present are precipitated with the tartrate

* By the Editor of the London Pharmaceutical Journal.

of lime, and on the subsequent decomposition of this salt by means of sulphuric acid, the tartaric acid set free is contaminated by the presence of these foreign matters, and the manufacturer is obliged, as in the case of citric acid, to resort to several crystallizations in order to obtain the whole of the acid in a state fit for the market.

Dr. Price's improvements in the manufacture of tartaric acid consist in combining bitartrate of potash with ammonia, so as to form tartrate of ammonia and potash, which may be effected, either by neutralizing impure bitartrate of potash or crude argol or crude tartar with gas-liquor or with a solution of ammonia, or with carbonate of ammonia, or sulphides of ammonium, obtained by decomposing tartrate or citrate of ammonia with hydrated caustic lime or carbonate of lime, or sulphides of calcium, or sulphides of barium or strontium, or with condensed volatile salts of ammonia, obtained by distilling gas-liquor or ammoniacal liquors. Impure bitartrate of potash being placed, with or without water, in a suitable and convenient vessel, a solution of ammonia or of salts of ammonia is added until the whole of the bitartrate of potash existing in the crude tartar or argol is neutralized, and a solution obtained of tartrate of potash and ammonia, which solution is to be separated by filtration or decantation from any insoluble impurities. The solution of tartrate of potash and ammonia, thus obtained, may be treated by either of the following processes:—To the tartrate of potash and ammonia a solution of chloride of calcium is added, until the whole of the tartrate of potash and ammonia is decomposed; that is to say, that for every 188 parts of bitartrate of potash existing in the crude argol or tartar, and now existing in solution as tartrate of potash and ammonia, a solution of chloride of calcium, corresponding to 112 parts of chloride of calciun, are to be added, with application of heat to the mixed solutions. The solution of chloride of potassium and ammonium is separated from the tartrate of lime produced, by decantation or filtration, and the solution containing chloride of potassium and chloride of ammonium is to be evaporated, care being taken that the solution be kept alkaline or neutral by the addition of either of the above mentioned ammoniacal salts or ammonia. The tartrate of lime deposited, during the evaporation is to be separated, and

the chlorides of potassium and ammonium in the solution separated by evaporation and crystallization. The mother-liquors, containing chlorides of ammonium and potassium, together with the tartrate of lime, are to be evaporated, and the tartrate of lime which deposits separated, or the mother-liquors may be evaporated to dryness, and the chlorides of potassium and ammonium be dissolved in water and filtered. The tartrate of lime left, together with that previously separated, is to be collected, and may be decomposed in the usual manner with sulphuric acid, and tartaric acid be obtained therefrom. The chloride of ammonium and chloride of potassium in the solution may be evaporated down and crystallized either together or separately.

Or, instead of the above process, the tartrate of ammonia and potash may be decomposed by boiling a solution of the same with sulphate of lime until the whole of the tartrate of potash and ammonia is decomposed into tartrate of lime and sulphate of potash and sulphate of ammonia. These may be separated in a manner similar to that described for effecting the separation of chloride of potassium and chloride of ammonium from tartrate of lime. The tartrate of lime obtained, after separating the sulphate of potash and sulphate of ammonia, may be decomposed in the usual manner by means of sulphuric acid, and after separation from the resulting sulphate of lime, and by evaporation and crystallization, the tartaric acid is fit for use.

Or, tartrate of potash and ammonia may be decomposed by treating a solution of the same, contained in any suitable distillatory apparatus, with carbonate of lime or hydrated caustic lime, and in the proportion of 60 parts by weight of carbonate of lime, ground, and made into a paste with water, or 30 parts by weight of lime slacked, and made into milk of lime, or with 36 parts of sulphide of calcium, or 36 parts by weight of soda waste, "oxysulphide of calcium," or 85 parts by weight of sulphide of barium, or 60 parts by weight of sulphide of strontium, for every 188 parts of bitartrate of potash previously existing in the crude argol or crude tartar, and now contained in solution as tartrate of potash and ammonia. Heat is to be applied, and the volatile ammoniacal products which distil off are to be collected, and may be employed for dissolving and neutralizing an additional quantity

of impure bitartrate of potash contained in crude argol or crude tartar. After having distilled off the ammonia or volatile ammoniacal salts, the tartrate of lime, or tartrate of baryta, or tartrate of strontia formed, is to be separated, and the solution containing tartrate of potash may be decomposed with nitrate of soda, as hereafter mentioned, or may be decomposed with either sulphate of lime, or chloride of calcium, or nitrate of lime, or chloride of barium, or nitrate of baryta, or nitrate of strontia, as to be after mentioned. The decompostion is to be effected in the same manner as tartrate of potash is now decomposed in the manufacture of tartaric acid by sulphate of lime and chloride of calcium. The tartrate of lime, or tartrate or baryta, or tartrate of strontia thus obtained, is separated from the salts of potash produced, and may be decomposed with sulphuric acid, as is now done in the manufacture of tartaric acid from tartrate of lime, and the solution, containing the potash salts, either sulphate or nitrate of potash, or chloride of potassium, be evaporated and crystallized. The apparatus and vessels now employed in manufacturing citric or tartaric acids, or in manufacturing sulphate of ammonia and ammonia, also employed in saltpetre refineries, are applicable to the processes described.

Dr. Price's further improvements in the manufacture of tartaric acid consists in combining bitartrate of potash existing in crude argols, crude tartar, and impure bitartrate of potash, with potash or soda, and in decomposing the tartrate of potash and tartrate of potash and soda with salts of lime, baryta, or strontia.

Having placed impure bitartrate of potash in a suitable vessel, it is first neutralized with a solution of sulphide of potassium or sulphides of potassium, and after separating the insoluble impurities, the solution is placed in a convenient vessel and decomposed with either sulphate of lime or chloride of calcium, or chloride of barium, or nitrate of baryta, or nitrate of lime, or nitrate of strontia, in a similar manner and in similar apparatus to that in which tartrate of potash is now decomposed with sulphate of lime or chloride of calcium. With the exception of sulphate of lime, the baryta, strontia, and lime salts may be added in solution or otherwise in about the following proportions, by weight, viz., 208 parts of chloride of barium, or 160 parts of chloride of strontium, or 112 parts of chloride of calcium, or 166 parts of nitrate of

lime, or 212 parts of nitrate of strontia, or 260 parts of nitrate of baryta, or 172 parts of sulphate of lime, to every 188 parts by weight of bitartrate of potash previously existing in the crude argol, crude tartar, or impure bitartrate of potash, and now existing as tartrate of potash in solution. The solution of the salts of potash thus obtained, being separated by decantation from the tartrate of lime and tartrate of baryta, may be evaporated and crystallized. The impure salts of potash may be purified by re-crystallization, and the tartrate of lime, or tartrate of baryta, or tartrate of strontia, after having been washed with water, may be decomposed with sulphuric acid in the same manner as tartrate of lime is now decomposed, and tartaric acid be herefrom obtained by crystallization. Impure bitartrate of potash, crude argol, or crude tartar, is to be neutralized by means of sulphides of sodium, as after mentioned, and tartrate of potash and soda thereby obtained, which said solution, after being separated from the insoluble impurities, may be evaporated and crystallized. Having obtained a solution of tartrate of potash and soda, by dissolving the said salt in water, the said solution is to be decomposed by means of chloride of calcium, in the proportion of 112 parts by weight of chloride of calcium to every 300 parts by weight of tartrate of potash and soda employed. The decomposition of the mixed solutions may be effected, by treating the same contained in a suitable vessel, the resulting tartrate of lime being allowed to settle. The supernatant solution containing chloride of sodium and chloride of potassium is to be withdrawn, and by evaporation and crystallization chloride of potassium and chloride of sodium obtained. Or a solution of tartrate of potash and soda may be decomposed in a similar manner, by heating the same with sulphate of lime, in the proportion of 172 parts by weight to every 300 parts by weight of tartrate of soda and potash employed. After separating the tartrate of lime formed, the solution containing sulphate of potash and sulphate of soda is to be evaporated, and these salts either obtained together, or they may be separated by re-crystallization. In order to separate certain soluble impurities, such as coloring matters, existing in the solutions of citrates or tartrates of ammonia, potash, or soda, their solutions may be filtered through filters or cisterns containing animal charcoal, or animal charcoal

may be mixed with their solutions, and be separated together with certain impurities by filtration.

As bitartrate of potash of commerce usually contains a certain amount of tartrate of lime, the said tartrate of lime will remain with the impurities after the before mentioned treatment of the said bitartrate of potash, and in order to utilize the same, the residuum is to be treated with sulphuric acid in the same manner, but in proportion to the amount of tartrate of lime present, as the tartrate of lime, mixed with impurities from impure bitartrate of potash, argols or tartars, is now decomposed, and the tartaric acid therefrom obtained.

Mr. Firmin's combined processes of obtaining tartrate of lime for the manufacture of tartaric acid, purified cream of tartar, and binoxalate of potash, are practically carried out in the following way:—Into a vessel such as is used in the manufacture of tartaric acid, a quantity of impure bitartrate of potash (argol or tartar) and water is placed, together with as much carbonate of lime as will suffice to neutralize the excess of acid existing in the bitartrate. By this means neutral tartrate of potash is formed, which remains in solution, and tartrate of lime, which precipitates to the bottom of the vessel. The solution of tartrate of potash is decanted from the tartrate of lime, digested on animal charcoal, and filtered. To such a quantity of this filtered colorless solution, as is found by analysis to contain 100 parts of tartrate of potash, 60 parts of crystallized oxalic acid (dissolved in water), or as much as will serve to decompose one half of the tartrate of potash contained in the solution, are then added. By this means, a neutral solution of oxalate of potash is formed, remaining in solution, whilst the tartaric acid liberated unites with the other half of the tartrate of potash, forming pure bitartrate of potash, which precipitates to the bottom of the vessel.

In the ordinary process of manufacturing tartaric acid, in which a solution of tartrate of potash is decomposed by means of sulphate of lime, a quantity of solution of sulphate of potash is obtained. Mr. Firmin applies this solution of sulphate of potash, when purified and filtered, to the manufacture of binoxalate of potash, by adding to as much of this solution at 180° F. as is found by analysis to contain 100 parts of sulphate of potash, a solution of 100 parts of crystallized oxalic acid, or a sufficient

quantity to effect the decomposition of the sulphate of potash. The solution thus obtained yields crystals of binoxalate of potash on evaporation. The residuary mother-liquor is dilute sulphuric acid.

In these cases the advantage sought to be obtained is, the use of a salt in the manufacture of binoxalate of potash, yielding that alkali at a more economical rate than carbonate of potash, (pearlash), which has hitherto been employed for this purpose. "Suppose, for instance," says Mr. Firmin, "100 lbs. of cream of tartar to contain 25 lbs. of potash, this I do not value at more than 2*s*., after deducting the loss of quantity owing to the difficult solubility of the sulphate (into which it is converted), and the cost of evaporation, which, owing to the same cause, is very great, while it would require 50 lbs. of pearlash, at a cost of 12*s*. 6*d*., to produce the same quantity, independently of the gain upon the purification of the cream of tartar precipitated. Or 100 lbs. of sulphate of potash, of 80 per cent., at 8*s*. per cwt., will yield, independently of sulphuric acid, 44 lbs. of potash, against 88 lbs. of pearlash, costing 22*s*."

Dr. Price's improvements in obtaining and refining bitartrate of potash consist in rendering the bitartrate of potash, contained in crude argol and crude tartar, more soluble, by combining the said bitartrate of potash with potash, soda, or ammonia, and obtaining soluble double and neutral tartrates (tartrate of potash and soda, tartrate of potash and ammonia, or tartrate of potash) which said tartrates, being separated from the insoluble impurities contained in the said impure bitartrate of potash, are decomposed by means of acids or acid salts, as after mentioned, and purified bitartrate of potash is obtained more economically and expeditiously than by the methods now generally employed. To effect this the following process is adopted:—Crude argol, or crude tartar, or impure bitartrate of potash, is placed in a closed vessel, with one or more exit pipes, capable of allowing any gas that may be generated to escape, or to be conducted away, and into such vessel is run a solution of sulphide or sulphides of sodium, sufficient to neutralize the bitartrate of potash. The vessel is so arranged, that artificial heat may be applied by steam or otherwise, or that a jet of steam may be admitted: the bitartrate of potash decomposes the sulphide or sulphides of sodium, forming

a tartrate of potash and soda, and sulphuretted hydrogen is liberated, which escapes by the exit tubes. The resulting solution of tartrate of potash and soda, being separated either by decantation or filtration from the insoluble impurities contained in the crude argol, crude tartar or impure bitartrate of potash, is concentrated in a suitable evaporating vessel to about sp. gr. 1.425 at 212° F., and allowed to cool to 60° F.; the crystals obtained are separated from the mother-liquors, and these liquors are again concentrated to sp. gr. 1.425 at 212° F. and allowed to crystallize; the mother-liquors left after this crystallization, if they contain much foreign matter, may be boiled with animal charcoal, filtered, evaporated, and set aside to crystallize. The remaining mother-liquors may be similarly treated, or mixed with liquors resulting from subsequent operations. The crystals of tartrate of potash and soda thus obtained, if they be not sufficiently pure, are to be dissolved in water and re-crystallized. Having obtained tartrate of potash and soda of the desired purity, the crystals are dissolved either in hot or cold water, and a saturated or partially saturated solution obtained; into this solution sulphurous acid is to be passed, which unites with the soda, forming soluble sulphite and sulphites of soda, and bitartrate of potash is precipitated. Sulphurous acid is to be added until the double tartrate of potash and soda is decomposed (which may be known when no further precipitation of bitartrate of potash occurs on the addition of a small quantity of an acid stronger than tartaric to a portion of the solution); the deposited bitartrate of potash is allowed to settle, and the solution is drawn off, and entirely or partially re-saturated with tartrate of potash and soda. Sulphurous acid is again passed into the solution, and the former operations repeated, the supernatant solution may then be separated, and will contain sulphites of soda and bitartrate of potash. The solution may be neutralized with sulphide of sodium or carbonate of soda and concentrated, when tartrate of potash and soda, sulphite of soda, and (if sulphide of sodium has been employed) hyposulphite of soda, will crystallize out. These salts may be separated by crystallization, and the tartrate of potash and soda may be decomposed with sulphurous acid as before mentioned. The bitartrate of potash, thus obtained, is to be washed with cold water, until the whole of the sulphites of soda are removed, and then dried, when it will be ready for use.

The resulting sulphite or sulphites of soda and hyposulphite of soda, which are obtained in this operation, may be dried and fused with small coal or charcoal, and converted into sulphide of sodium. Or the sulphite or sulphites of soda and the hyposulphite of soda may be decomposed in a suitable vessel by sulphuric acid, and the sulphurous acid liberated be collected and employed for precipitating bitartrate of potash from tartrate of potash and soda.

A solution of tartrate of potash and soda, obtained as before described, by neutralizing bitartrate of potash with sulphide of sodium, or from any other source, may be decomposed with bisulphate of potash or bisulphate of soda, or acid sulphates of potash, or acid sulphates of soda, added in the proportion of 300 parts by weight of tartrate of potash and soda (in crystals) dissolved in water, to every 40 parts by weight of sulphuric acid not in combination as neutral sulphate of potash or soda; that is to say—in employing bisulphate of potash, 300 parts by weight of tartrate of potash and soda are to be used for every 137 parts by weight of bisulphate of potash, and 300 parts by weight of tartrate of potash and soda are to be employed for every 121 parts by weight of bisulphate of soda (solid.)

Having dissolved, in any suitable vessel, the acid sulphates of soda, a solution of the tartrate of potash and soda, obtained as before mentioned, is to be added, and after being well agitated, the precipitated bitartrate of potash is allowed to settle. The supernatant solution is then to be separated, and saturated either with sulphide of sodium or carbonate of soda, and evaporated, in order that the sulphate of soda may be separated by crystallization from the tartrate of soda and potash existing in the said solution. The tartrate of potash and soda thus obtained from the supernatant liquor, is to be decomposed with a solution containing an equivalent proportion of acid sulphate of soda, and the deposited bitartrate of potash separated.

If acid sulphate of potash be employed to decompose the tartrate of potash and soda, the supernatant solution, having been separated from the precipitated bitartrate of potash, and having been neutralized with sulphide of sodium, or sulphide of potassium, or carbonate of soda, or carbonate of potash, is to be evaporated, and the sulphate of potash and sulphate of soda separated from the tartrate of potash and soda by crystallization. The tartrate

of potash and soda may be decomposed in a similar manner by means of acid sulphates of soda, and after separating the deposited bitartrate of potash, the supernatant solution may be neutralized with sulphides of sodium or carbonate of soda, and by crystallizing the resulting sulphite of soda and hyposulphite of soda, obtained by evaporation and crystallization, they may be decomposed by adding an equivalent of sulphuric acid to a solution, or to crystals of sulphite of soda or hyposulphite of soda contained in a suitable vessel, and the free sulphurous acid liberated, collected and employed for decomposing tartrate of potash and soda as before mentioned.

Dr. Price's further improvements in the manufacture of bitartrate of potash, relate to the decomposition of tartrate of ammonia and potash by means of acids and acid salts, so as to obtain purified bitartrate of potash, which is effected as follows: Having obtained a solution of tartrate of potash and ammonia in the manner before described, and the said tartrate of potash and ammonia having been placed in a suitable vessel, sulphurous acid is passed into the same, until no further precipitation of bitartrate of potash is occasioned on the addition to the solution of a small quantity of an acid stronger than tartaric acid. The deposited bitartrate of potash being separated, the solution, containing sulphite of ammonia and bitartrate of potash may be decomposed in a suitable vessel, by means of sulphuric or hydrochloric acid, so as to obtain sulphurous acid, which may be employed for effecting the decomposition of a subsequent quantity of a solution of tartrate of potash and ammonia. The resulting sulphate of ammonia or chloride of ammonium, containing in solution a certain amount of bitartrate of potash, is to be neutralized with anyof the before mentioned volatile alkaline ammoniacal salts, and evaporated; and the sulphate of ammonia or chloride of ammonium obtained by crystallization. The mother-liquors containing tartrate of potash and ammonium are to be acidified with sulphurous acid, in order to obtain bitartrate of potash. The resulting solution is then neutralized with ammonia, and evaporated as before mentioned, care being taken, in both instances, that the solution be kept slightly alkaline by means of ammonia or alkaline ammoniacal salts during and after concentration.

The tartrate of potash and ammonia may be decomposed, and

purified bitartrate of potash obtained, by decomposing the said tartrate of potash and ammonia with bisulphate of potash or bisulphate of soda, or acid sulphate of potash or soda in the same manner, and in the same proportions, as described under the process for decomposing tartrate of potash and soda with acid sulphate of soda and acid sulphate of potash, for every 188 parts by weight of bitartrate of potash originally contained in the impure bitartrate of potash. If bisulphate of potash is employed, bitartrate of potash is precipitated, and sulphate of potash and sulphate of ammonia remain in solution with a certain amount of bitartrate of potash. The solution is kept neutral or alkaline by the addition of ammonia or the volatile salts thereof as before mentioned, and when evaporated to a sp. gr. of about 1.350 at 212° F. a solution of bisulphate of potash or sulphuric acid may be added, in sufficient quantity to neutralize the ammonia existing in excess, and also that which is combined as tartrate of potash and ammonia. The resulting bitartrate of potash which precipitates is separated, and the solution neutralized with ammonia, or potash, or their carbonates, or sulphides of the same, and evaporated, in order to obtain by crystallization the sulphate of potash and sulphate of ammonia. The tartrate of potash and ammonia existing in the mother-liquors may be decomposed as before mentioned.

Or, sulphuric or hydrochloric acid may be employed to decompose the tartrate of potash and ammonia obtained by neutralizing impure bitartrate of potash by means of gas-liquor, ammonia, carbonate of ammonia or sulphides of ammonia, obtained by decomposing citrates on tartrates of ammonia, by means of hydrated caustic lime, carbonate of lime, or sulphides of calcium, sulphides of barium or sulphides of strontium, in the proportion of 50 parts of monohydrated sulphuric acid, and 37 parts of actual hydrochloric acid contained in any dilute acid solution, to every 188 parts of bitartrate of potash existing in the crude argol or crude tartar, and now existing in solution as tartrate of potash and ammonia; after separating the precipitated bitartrate of potash, the resulting solution, containing the sulphate or muriate of ammonia, may be separated by crystallization. The tartrate of potash and ammonia remaining in the solution, is to be decomposed with an equivalent proportion of either sulphuric or hydrochloric acid.

Tartrate of potash having been obtained, either by neutralizing bitartrate of potash with sulphide of potassium, or neutralizing bitartrate of potash with carbonate of lime or lime, the solution of tartrate of potash having been placed in any suitable vessel, sulphurous acid is passed into it, until no further precipitation is effected, by the addition of a small quantity of an acid stronger than tartaric acid to the solution. The precipitated bitartrate of potash is separated, and washed with cold water. The decanted or filtered solution is neutralized with sulphide of potassium, and concentrated to about sp. gr. 2.000 at 212 F., the tartrate of potash existing in solution is decomposed by sulphurous acid, the resulting bitartrate of potash is separated as beforementioned, and the mother-liquors, being separated from the precipitated bitartrate of potash, after having been neutralized with sulphide or sulphides of potassium, are concentrated, and the sulphite and hyposulphite of potash are separated from the tartrate of potash by crystallization, or the sulphite and hyposulphite of potash thus obtained may be re-converted into sulphide of potassium, by heating the dried salts with small coal, in a reverberatory or suitable furnace, and the sulphide of potassium resulting, may again be employed for neutralizing and dissolving impure bitartrate of potash, or the sulphides or hyposulphite of potash may be decomposed with a stronger acid, and the liberated sulphurous acid be employed for a subsequent operation.

Another improvement of Dr. Price's in the manufacture of purified bitartrate of potash consists in that tartrate of potash and soda (obtained by neutralizing impure bitartrate of potash by sulphide of sodium, or obtained by decomposing tartrate of potash and ammonia, or tartrate of potash by means of nitrate of soda or sulphate of soda, or chloride of sodium, so as to obtain nitrate of potash or sulphate of potash, or chloride of potassium and tartrate of potash and soda before described) is to be decomposed by sulphuric acid or hydrochloric acid, in the proportion by weight of 50 parts of monohydrated sulphuric acid contained in solution in water, or 37 parts by weight of actual hydrochloric acid contained in solution in water, to every 300 parts by weight of tartrate of potash and soda employed. Tartrate of soda and potash obtained as above mentioned, being dissolved in either warm or cold water, and placed in a convenient vessel, sulphuric

or hydrochloric acid is added in the proportions above mentioned. The bitartrate of potash, which is precipitated, is allowed to settle, and the supernant solution is decanted or filtered from the deposited bitartrate of potash. The solution separated is neutralized with sulphide or sulphides of sodium, and concentrated by evaporation, when sulphuric or hydrochloric acids are to be added to decompose the tartrate of potash and soda existing in the concentrated solution, and they are to be added until no further precipitate of bitartrate of potash is occasioned by the addition of the same to the said solution. The said solution, being separated from the precipitated bitartrate of potash, and neutralized by means of sulphides of sodium as before mentioned, is to be evaporated, in order that the salts of soda (sulphate of soda or chloride of sodium) may be separated by means of crystallization. The mother-liquor remaining will contain a small quantity of tartrate of potash and soda, which may be decomposed by means of sulphuric or hydrochloric acid as before mentioned, or may be mixed with mother-liquors resulting from a subsequent operation.

Mr. Gatty's process for obtaining tartrate of lime to be used for the manufacture of tartaric acid, conjointly with carbonate of soda or potash, consists in decomposing solutions of the neutral tartrate of potash and neutral tartrate of soda by means of carbonic acid gas or carbonate of lime, and is performed in the following manner:—Into a cylindrical wooden vessel, of the capacity of about 400 gallons, 300 gallons of solution of neutral tartrate of potash, marking 5° of Twaddell's hydrometer, are introduced through an opening in the top of the vessel. 34 gallons of milk of lime, each gallon containing one pound of lime, are then added, and the opening closed by means of an air-tight cover. Carbonate of lime, or a mixture of carbonate of lime and lime, may be employed instead of lime only. An agitator, passing through an air and steam-tight stuffing box in the top of the vessel, is then set in motion, and a current of carbonic acid gas passed into the mixture until its complete saturation is effected. The result is, that bicarbonate of potash and tartrate of lime are formed, the former of which remains in solution, whilst the latter is precipitated to the bottom of the vessel. The clear solution of bicarbonate of potash is now run off, and the tartrate of

lime well washed, to remove all the potash salt; the first washings being mixed with the stronger solution, and the latter reserved to be used for the first washing waters of another operation. The tartrate of lime thus produced may be employed in the manufacture of tartaric acid. The solutions of bicarbonate of potash are next evaporated to dryness in an iron pan, by which means the bicarbonate is changed into sub-carbonate, which may be calcined in a reverberatory furnace, when a carbonate of potash will be produced, sufficiently pure for most manufacturing purposes. If required of greater purity, it may be purified in the usual manner. The carbonic acid gas may be produced in any known manner. The same process is applicable to the manufacture of soda, substituting neutral tartrate of soda for the neutral tartrate of potash above-mentioned.—*London Pharmaceutical Journal, Jan.* 1854.

ON THE USE OF BENZOLE IN THE PREPARATION OF VEGETABLE ALKALOIDS.*

By John Williams.

The application of Benzole to the elimination of various vegetable alkaloids having engaged my attention for some time past, I venture to lay the present paper before you, more in the hope of its receiving practical adaptation from your hands, than from any idea that the subject has been worked out to its fullest extent.

First, then, a few words respecting benzole:

This important and interesting body was first discovered by Faraday, and named by him *bicarburetted hydrogen;* it was afterwards produced by decomposition of benzoïc acid by heat in presence of lime or baryta, and hence named benzole; it has, however, since been proved to exist in very considerable quantities in coal-tar naphtha, or that portion of the liquid products of the destructive distillation of coal, which floats on water, boils below the temperature of 212° F., and congeals to a solid mass at 32°. The ordinary coal-tar naphtha of commerce is a very impure product; the mode of separating the benzole from

* Read before the "Chemical Discussion Society," Oct. 27th, 1853.

it, was, I believe, first pointed out by Mansfield. He took the ordinary naphtha, distilled it in a still with a double head, so constructed that only that portion of the naphtha which distils at the lowest temperature was collected; the product thus obtained was digested with oil of vitriol, which turned it black. I have found it necessary that this part of the process should be repeated at least twice, or the proper degree of purification would not be effected. The benzole thus separated was now washed with water, dried with anhydrous sulphate of soda, and re-distilled; it was then exposed to a freezing temperature, and, when solid, subjected to pressure, when the pure benzole was obtained; but, for the purposes I have to point out, I do not consider this last operation necessary.

Benzole, thus obtained, is a clear, volatile liquid, having still a distinct odor of coal gas, but more aromatic; it is quite insoluble in water, and is excessively inflammable; this last property renders great caution necessary in conducting the processes I am about to describe. Benzole, in its powers of solution, may be likened to ether, but, from its low price, and from its not being so volatile as that body, it possesses practical advantages in working, which, I think, will more than counterbalance its disagreeable odor and great inflammability.

The first application of benzole I have to describe is in the preparation of quinine and its allied bases. An acid infusion of the bark was prepared in the usual manner; sufficient caustic potassa was added to render it strongly alkaline; it was then shaken with about one-fourth of its bulk of benzole; the whole of the quinine, quinidine, quinoïdine, &c., was at once yielded to that agent. I found, however, that the cinchonine was not extracted without greater difficulty. The benzole was distilled off, leaving the mixed alkaloids as a slightly yellow, resinous mass, which, when dissolved in weak sulphuric acid, and filtered, yielded a solution from which the white bases were at once precipitated, and separated in the usual manner.

This process, I think, would not answer for manufacturing quinine on a large scale, but I find it is a very elegant, certain, and easy mode of performing the analysis of cinchona barks, for, if moderate care is used, the alkaline liquid remaining after

the action of the benzole does not contain the smallest trace of alkaloid.

The next substance acted upon was the quinoïdine or amorphous quinine of commerce, which, as usually found, is a blackish, resinous looking substance, with a peculiar, burnt, empyreumatic odor. When this body is powdered and digested with benzole it yields all its bitter principle to it, the benzole generally separating from the mass almost colorless. By distilling, or dissolving, the residuum in weak sulphuric acid, filtering (which effectually deprives the liquid of any odor of benzole with which it may be contaminated) and precipitating with caustic soda, the quinoïdine or amorphous quinine is obtained of a pale straw color, and when dissolved in weak SO^3 yields a nearly colorless solution. Of course the quantity yielded is comparatively small—rarely more than a drachm from an ounce—but often not nearly so much, thus rendering the real quinoïdine a more expensive body for medical use than even quinine itself.

I may here mention one great advantage in the use of benzole in preparing these alkaloids, which is, that the coloring matter contained in the liquid, extract, or powder acted on, is almost invariably left behind, so that with one operation the base is obtained pure, or nearly so, and any odor arising from the benzole is lost when the base is dissolved in acid, filtered, and re-precipitated.

Morphine was the next body to which my attention was directed, but in this instance I failed to obtain a satisfactory result; morphine being but slightly, if at all, soluble in benzole, in which particular benzole again agrees with ether.

With the next alkaloid, however, I was more successful. Nux vomica seeds were taken, softened in boiling water, sliced in a proper machine, and boiled in many successive waters until that menstruum ceased to extract either color or taste from the seeds. It might be advantageous to use weak sulphuric acid in this operation; but, for reasons which it is not necessary to mention, this was not done. The liquids were now boiled down in a copper to a convenient bulk, filtered, and again evaporated to the consistence of thin treacle. To this aqueous extract a strong solution of caustic potassa was added until it was strongly alkaline. It was then mixed with an equal bulk of benzole, well agitated,

and kept in a warm stove for about twelve hours. The first benzole was poured off, and a second, but a smaller quantity, was added, and left to digest in like manner with the extract, and afterwards the mixed benzoles distilled—the residuum, treated with acetic acid, filtered, and precipitated with caustic soda; the precipitate was white, and consisted of strychnia and brucine. These were dissolved in sulphuric acid and separated in the usual manner. The quantity of strychnine yielded by this process is large; and, when it is dissolved in a little weak alcohol and allowed to crystallize, the base is yielded of great beauty and perfect purity.

The next process I have to describe is one for preparing cantharadine. This substance, though of great use to the medical man, has hitherto, from the great expense of manufacturing it, been comparatively little used in its pure form. Powdered cantharides are to be heated to about 150°, with rather more than an equal bulk of benzole; after about an hour's digestion the magma is to be transferred to a percolator; and, when the first portion of benzole has gone through, fresh warm benzole is passed through it. A pound of cantharides requires about from six pints to a gallon of benzole to be thoroughly exhausted. The benzole is now to be distilled. A rather dark colored oily liquid is the result, which is to be poured into an evaporating-basin, and left for, say twelve hours; at the end of which time the liquid will be found studded with magnificent crystals of cantharidine sometimes a quarter of an inch long.

I found some difficulty in purifying these crystals from the mother-liquid, but at length succeeded by washing the whole mass in a beaker-glass with a little cold ether, which dissolved the dark oily liquid freely, but scarcely affected the cantharidine; the crystals subsided to the bottom, and the supernatant liquid being poured off, the crystals were washed once or twice more with very small quantities of ether, and then turned out on bibulous paper; they speedily dried but were not quite white; by dissolving them in a flask of fresh benzole, heating, adding a little charcoal, filtering, and allowing the liquid to cool, they were obtained of perfect whiteness, but not so large as at first. From a pound of cantharides about thirty grains of cantharidine may thus be readily obtained.

I must caution those that follow this process to beware of the blistering property of the benzole solution of cantharidine in all its stages. Unless great care be used severe blisters will be the painful result.

The following applications of benzole have not yielded quite such satisfactory results as the foregoing, but still such as to encourage us to persevere in the application of this body to delicate chemical manipulation, and to prove that it is an important addition to our means of organic research.

Atropine was obtained, though not in distinct crystals, by the following method. An aqueous extract of belladonna, prepared with great care, *in vacuo*, was rubbed with sufficient water to soften it; then a little very concentrated solution of carbonate of potassa having been incorporated, the benzole was added, and the whole well rubbed together. After two or three quantities of benzole had thus been rubbed with the extract they were mixed and distilled; the dark oily residuum was treated with acetic acid, filtered, and precipitated with ammonia, a white curdy precipitate was formed, which, however, was not yet pure, as it refused to crystallize when dissolved in alcohol and evaporated: a resinous or oily matter still contaminated it, which interfered with its purification. This subject still engages my attention, and I hope at a future opportunity to be able to give a better account of the matter.

Extract of henbane, prepared with equal care, was treated in a similar manner; the acid solution of the oily residuum did not, however, give a curdy precipitate with ammonia, but only a slight opalescence; however, upon shaking the liquid with an equal bulk of ether, separating and allowing the ether to evaporate very slowly, a minute quantity of crystals were on one occasion produced, which burnt perfectly, were soluble in a few drops of dilute acetic acid, and precipitated again as a white cloud by ammonia, which cloud was instantly taken up by being shaken with ether.

I next turned my attention to the so-called sulphate of bebeerine of commerce. It was treated with a solution of caustic potassa, and then with benzole; the benzole being distilled off yielded the bebeerine of a pale straw color, but in very small quantity. It was soluble in acids and precipitated by alkalies,

and possessed the usual basic characters. I did not attempt to crystallize it.

Extract of digitalis was tried, and readily yielded its alkaloid.

Extract of conium also, the benzole being washed with weak sulphuric acid, yielded the sulphate of conium, which, afterwards distilled with strong potassa, yielded the coneine in a state of purity.

Taraxacum, sarsaparilla, and colocynth, were tried, but no active principles could be eliminated from these bodies by this process.

Nut galls, in fine powder, were treated with benzole. Tannin, of good color, was the result of its evaporation; but from the impossibility of perfectly freeing it from the odor of the benzole, I fear that this process will not prove of practical use, unless in the production of tannin on the large scale for use in the arts, when the odor would be of minor importance.

I hope to be able on a future occasion to give you a few more illustrations on the practical use of benzole in operative chemistry.—*N. Y. Jour. of Pharm. from Chemist*, December, 1853.

ON THE PREPARATION OF COPAL VARNISH.

By Prof. Heeren.

There is no difficulty in dissolving copal in fatty and volatile oils when the resin has been previously fused; by this process, however, a more or less distinct coloration is produced, and the natural hardness of this fine resin is injured. It has therefore been often attempted to dissolve copal without previous fusion; but, as is well known to all who have occupied themselves with this question, great difficulties have been found in effecting the solution. Directions have been given to soak the pounded copal in ether or ammonia until it swells up into gelatinous form, and then to dissolve it in strong alcohol; but this process never succeeded with the author, though he tried it repeatedly. Others recommend hanging the copal in a small bag in a retort, in which absolute alcohol is gently boiling. This method also failed, in the author's hands, in producing even a tolerably-concentrated varnish.

The best prescription appears to the author to be that given

by Freudenvoll in his treatise on the preparation of varnishes. According to him, 4 oz. of West Indian copal are dissolved in a mixture of

4 oz. oil of turpentine, and
6 oz. alcohol of spec. grav. 0·813;

or a mixture of

4 oz. sulphuric ether,
4 oz. oil of turpentine, and
4 oz. alcohol of spec. grav. 0·851.

When engaged in testing this process, which gave very good results, the author found a small variation, which he describes as follows, particularly efficacious:—

Two sorts of copal occur in commerce, the East and West Indian. The former is usually in small, irregular, rounded pieces, with a finely verrucose surface, the resemblance of which to the skin of a goose has obtained for it the name of "goose copal." It is of a somewhat yellow color, and is preferred for the manufacture of oily copal varnish, because it acquires less color by fusion than the West Indian. The latter does not possess a warty surface; it is very pale in color, often nearly colorless, and occurs in large irregular fragments, partly with a rounded surface and partly with a shelly fracture.

West Indian copal can only be employed in the following solution, the East Indian forming only gelatinous lumps, but never a solution. The solvent is a mixture of

60 parts by weight of alcohol of spec. grav. 0·813,
10 parts by weight of sulphuric ether,
40 parts by weight of oil of turpentine,

in which 60 parts of copal are to be dissolved for the production of a varnish of an oleaginous consistence. Solution takes place even in the cold, without any previous gelatinous swelling of the copal; but it is effected much more rapidly with the assistance of a gentle heat. As, however, single pieces are often found in the West Indian copal, which, instead of dissolving, only swell up in the fluid, by which the rest of the solution is spoiled, it is advisable to select only the large and perfectly clear pieces for the purpose of varnish making, and to test each first of all as to its solubility. This little trouble is richly repaid by the certainty of the result.

To test this quality, a small splinter of the copal is put into a small test tube; a little of the solvent fluid is then poured in, and the whole is heated. If the copal dissolves completely in a few minutes without becoming gelatinous, it is good.

When the desired quantity of good copal has been got together in this manner, it is to be pounded to a tolerably fine powder, which is to be put into a glass retort or flask, the necessary quantity of the solvent added, and the whole heated and shaken until solution is effected. To clear the varnish, which may appear somewhat dull, from dust or other impurities, it may be allowed to stand a long while until these settle; or if it be desired to effect this quickly, it may be filtered through blotting paper, placed as a filter in a glass funnel; the filter must not project above the edge of the funnel, so that the latter may be closed by a glass plate laid over it. The passage of the thick varnish is of course very slow, but the varnish is obtained perfectly clear in this manner; and if the copal employed were very clear, it is nearly colorless. It dries rapidly, but like all turpentine varnishes, retains a slightly sticky surface for some days.—*Chem. Gaz., May* 1, 1854, *from Dingler's Polytech. Journ.*

THE ESSENTIAL OIL OF BITTER ALMONDS.

By Dr. Douglass Maclagan.

He commenced by observing, that attention had been directed in Edinburgh to this subject by the recent occurrence of a case of accidental poisoning, with a bottle of a flavoring substance marked quintessence of ratafia, and which was, in reality, oil of bitter almonds. Dr. George Wilson, who examined the poison in this case, had brought under the notice of the authorities the well-known fact that by chemical means the hydrocyanic acid might be separated from the hydruret of benzule, which forms the real flavoring ingredient, and that thus the great source of its poisonous properties might be removed. It was still matter of doubt, however, whether even after complete removal of the hydrocyanic acid, the hydruret of benzulo was or was not poisonous, and Dr. Maclagan had made a series of experiments to satisfy himself on this point. The author first reviewed the processes for separating the prussic acid from the oil. Agitation

of the oil with abundance of milk of lime and caustic potash, and subsequent distillation, appeared to be quite effectual; but as the addition of a salt of iron does no harm, and does not add materially to the expense, and as this method has succeeded well with him, he was disposed to prefer it. The essential point seemed to be that the agents employed, should, by careful and sufficiently prolonged agitation, be brought into perfect contact with the oil. Dr. Maclagan said that it had been suggested that perhaps one distillation might be saved by adding the lime and potash to the marc of the almonds when the oil was first distilled. This appeared to him *à priori* to be unlikely, from the facility with which both the amygdalin and the emulsin of the bitter almond were acted on by alkalies, and accordingly he had found on actual trial, that under these circumstances, no oil was separated, but only an ammoniacal liquor distilled over.

Dr. Maclagan insisted on the absolute necessity, whatever process of purification was followed, of carefully testing the product for hydrocyanic acid. This was best done by agitating the oil briskly with aqua potassæ, passing through a wetted filter, and applying the iron test in the usual way to the filtrate. It was to the neglect of sufficient agitation with aqua potassæ that he ascribed the fact, that in oil in which no hydrocyanic acid had been detected, it had sometimes on subsequent trials been readily found. It had been suggested that possibly the hydrocyanic acid might not really exist in newly rectified oil, but might be re-developed in process of time. Dr. Maclagan showed that this was not the case, by a specimen of the rectified oil, but prepared by himself twelve months ago, still being quite free from all trace of hydrocyanic acid, and moreover, not giving, under Lassaigne's potassium test, any trace of nitrogen, without which, of course, hydrocyanic acid could not be re-developed.

In relation to the more immediate question, whether or not the pure hydruret of benzule was poisonous, the author recapitulated the views and contradictory statements that had been made on the subject, and noticed the statement made in the posthumous volume of Dr. Pereira's *Materia Medica*, on the authority of Mitscherlich, that the pure oil was a poison. He then recounted his own experiments on animals, giving the preference for this purpose to dogs over rabbits, as being more fitted to test

the probable effects of a poison on the human subject. He had experimented with both these kinds of animals. The experiments on dogs were five in number. These animals got respectively twenty-five minims, ʒi, ʒij, and two of them ʒiij of the oil, and in no instance did death or urgent symptoms of any kind occur. Slight vomiting was produced by the ʒij and ʒiij doses; but the escape of the animals could not be ascribed to this, because in one after a ʒiij dose, vomiting did not occur for twenty-five minutes; and in another after a similar quantity, the animal, within two minutes of its vomiting, passed urine, smelling strongly of the oil, which showed that it had been absorbed in the circulation. It was remarkable, that in some of these experiments, in which the animals were in no way seriously affected, the sample of oil furnished to him actually did retain some hydrocyanic acid, as shown by the iron test. It was satisfactory to find that this test could thus detect quantities of a hydrocyanic acid too small to produce poisonous effects.

Dr. Maclagan then related his series of experiments on rabbits:—

ʒj. of the oil not entirely free from hydrocyanic acid produced no effect worthy of note for four hours, during which the animal was under observation. The rabbit was found in apparently perfect health next morning, and fed as usual, but died after thirty-nine hours. It was found to have inflammation of both lungs.

ʒij. of the same oil were given to another rabbit; the animal fell on its sides in eight minutes, with complete relaxation of all the muscles, and died in sixteen minutes, without further approach to convulsions than some twitching of the muscles of the head and neck.

ʒij. of another sample of oil, perfectly free from hydrocyanic acid, caused the animal to fall on its side in ten minutes, and it was moribund in nineteen minutes. Dr. Maclagan being desirous of trying the effect of cold affusion, practised it on this rabbit. It had the effect of temporarily making the breathing slower and more regular; but the animal died fifty minutes after taking the oil.

ʒij. of another sample of oil prepared by himself, and perfectly free from prussic acid, were given to a strong buck rabbit.

No effect was produced for twenty minutes; it looked a little dull, but revived shortly, and remained quite well for four hours and a half, during which it was under examination, but it died in the course of the night.

With the urine of these rabits Dr. Maclagan was enabled to confirm the observation of Wöhler and Frerichs, that the oil in its passage through the system was converted into hippuric acid, and if administered in a large quantity, partly passed unchanged into the urine.

To contrast the action of the oil on rabbits with that of other volatile oils, the author made some further experiments. ʒij. of oil of carraway on a dog produced no other effect than slight vomiting. ʒj. of oil of cloves on a rabbit the animal fell motionless on its side in fifteen minutes, and died in an hour and a quarter. The symptoms were essentially the same as those produced by the rectified oil of bitter almonds, though the fatal result was not so speedy.

Dr. Maclagan summed up the evidence afforded by the experiments of others by stating the following conclusions to which he had been led.

1. That the marked difference between rectified and unrectified oil shows that the poisonous action of the latter is essentially due to the hydrocyanic acid which it contains.

2. That the oil really free from hydrocyanic acid, in doses of a few drops, does not act as a poison on animals generally; and that the instances of fatal effect on man and animals from such doses of unrectified oil must be referred entirely to the hydrocyanic acid.

3. That experiments on rabbits with quantities of half-a-drachm and under, invariably show that if quite free from prussic acid, such doses do not cause fatal effects. But in larger doses [a drachm and upwards] it does, even when quite free from hydrocyanic acid, prove fatal to rabbits, but with great variation in respect to the rapidity of the death, which variation is due to the physiological peculiarities of these animals.

4. That in dogs, whose organization renders them much better subjects for testing the probable effects of the substance on man, dose seven so large as three drachms of the oil, nearly or entirely free from prussic acid, produce no other affect than a little vomiting, and do not cause death or even dangerous symptoms.

5. That experiment shows that if this substance is to be called a poison at all, it must be regarded as one of no great activity; but that in reality it cannot, even on the ground of its effects on rabbits, be styled a poison, without including under that denomination many substances, such as oil of cloves, which cannot be regarded as poison in the common sense acceptation of the term.

6. That the use of the purified oil to make flavoring condiments, is open to no objection which would not apply to ordinary aromatic volatile oils, and that the spirituous solutions sold for this purpose, if made of properly purified oil, are not dangerous.

7. That since by due care the oil can be so freed from hydrocyanic acid as to deprive it of active poisonous properties, great culpability will attach to the sale of preparations made with unrectified oil.—*Trans. North British Branch of Pharm. Society.*

[Note.—As the sale of bitter almonds is becoming more and more extensive as a flavoring material, we have deemed it advisable to re-publish the above and the two following papers, for the information of apothecaries and druggists who may desire to take the precaution to free this oil from prussic acid before they vend it for culinary purposes.—*Ed. Am. Jour. Ph.*]

ON THE PURIFICATION OF ESSENTIAL OIL OF ALMONDS.

By Mr. George Whipple, F.C.S.

The purification of oil of bitter almonds, and the means by which hydrocyanic acid can be most advantageously separated from the crude oil, having recently occupied the attention of Pharmaceutical Chemists, I beg to communicate some of the results of my experience as a drawer of this and other essential oils.

The method recommended by Dr. Maclagan (*Pharmaceutical Journal*, vol. xiii., p. 277) for removing hydrocyanic acid, is not only complex, but fails to render the oil permanently innocuous. —(Vide Pereira's *Materia Medica*, 3rd edit. p. 1776.)

Some years ago I thought of obtaining hydrocyanic acid and essential oil of almonds at one and the same time, by receiving the contents of the condensing worm into a solution of nitrate

of silver, and subsequently decomposing the resulting cyanide of silver with hydrochloric acid. Since the publication of Dr. Maclagan's paper I have tried this process, and the oil obtained by it was submitted to Dr. Stenhouse for examination, and pronounced by him to be entirely free from hydrocyanic acid. Whether it be innocuous I leave to be decided by others.

When commercial oil of bitter almonds is mixed with a solution of nitrate of silver, and the mixture allowed to stand for some time, crystals of cyanide and nitrate of silver are abundantly formed.

Thirty-two parts of the crude essential oil, sp. gr. 1.079, were redistilled, and received into a solution of nitrate of silver, when an abundant deposit was formed containing cyanide of silver. The oil was collected, added to a second portion of nitrate of silver in solution, and again distilled, yielding six parts of a colorless oil of sp. gr. 1.051, in which no trace of hydrocyanic acid could be detected. This oil retains the flavoring of the bitter almond.

In distilling the essential oil from almond cake, three oils differing in density are obtained. The mixture of these oils is opaque, but becomes bright on being filtered. These results, however, are not peculiar to the production of almond oil. Sassafras yields two oils, a stéaroptène and an odorless salt, very like common alum in appearance, but perfectly soluble in the oils from which it is deposited. This stéaroptène is deposited like the crystalline matter in oil of almonds, but so far as my experience has gone, the product from sassafras is always the same, which in the case of the almond I have not found to be so. The largest crystalline deposit from oil of bitter almonds that has come under my notice was of the consistence and color of honey. This when washed with alcohol afforded the lemon-colored crystals which were examined by the late Dr. Pereira, and a specimen of which is among the collection of the Pharmaceutical Society. Another remarkable deposit which I obtained from oil of bitter almonds was examined by Dr. Faraday, and said to be either benzoic or amygdalic acid.

Subsequently on using steam for distilling the oil, all the crystalline deposits I have obtained, which have been examined by Dr. Stenhouse and others, have been designated benzoic acid.

After this crystalline deposit has been formed it is sometimes dissolved and again re-deposited, in which respect it differs from what occurs in the case of oil of sassafras. I have never found, if the stéaroptène of sassafras is dissolved in the oil from which it was deposited, that it is deposited again, nor have I been able to crystallize it after it has been liquefied.

We know that benzoic acid is instantly and largely dissolved by essential oil of almonds, and again deposited with change of temperature; and I have placed on the table some of the crystalline deposit thus formed. It will be observed that the appearance of the crystals is different from that of the crystals which are formed spontaneously in oil of bitter almonds. The latter appears to me more nearly to resemble the crystalline product obtained from balsam of tolu, which by Thompson and others has been designated benzoic acid, but which has subsequently been shown to consist principally of cinnamic acid. This cinnamic acid is said to be formed by the oxidation of hyduret of cinnamyle, just as benzoic acid is produced from hyduret of benzoyle. I have observed that during the formation of the crystalline deposit in oil of bitter almonds, water is at the same time produced, which floats upon the oil, a fact which supports the opinion of the crystalline matter being benzoic acid.

Although the crude oil of bitter almonds contains a large but variable quantity of hydrocyanic acid, yet the hyduret of benzoyle is found to be insoluble in hydrocyanic acid, at least in the aqueous acid. Whether it be so in the anhydrous acid, as was hinted by Dr. Stenhouse, is an interesting subject for inquiry.

I may here notice the impropriety of employing the water obtained in the distillation of the essential oil of almonds for culinary purposes. The quantity of hydrocyanic acid contained in this water varies very considerably, and the strength of it is sometimes such as to render it highly dangerous. The solution of the essential oil in spirit, called essence of almonds, as commonly sold, is also, as I conceive, unnecessarily strong. It is usually prepared of the strength of one part of oil and seven of spirit. If made in the proportions of three fluid drachms of oil to sixteen fluid ounces of spirit, it would afford a better flavor, and be much safer.—*Ibid.*

PURIFICATION OF ESSENCE OF ALMONDS.

By Mr. T. B. Groves.

The case of poisoning by bitter almonds, which occurred some months back in London, has once more directed the attention of Chemists to the means of depriving the oil of its poisonous character.

The pure oil is known to be innocuous, at least as much so as any merely irritating oil can be, and that its poisonous nature is entirely owing to a contamination of prussic acid, which the oil contains in addition to benzoic acid, benzoine, &c. The proportion of prussic acid varies much, some samples containing, as stated by Taylor, twice as much as others, or even more. Turner states it to be 12.6 per cent., others eight or ten, at any rate it may be said to be from four to six times the strength of the acid of the London Pharmacopœia. The oil itself is, I believe, seldom sold without dilution with spirit, except as a scent for pomades, in which case the presence of prussic acid would be of no importance. Instances, however, have occurred, when it has been sold as almond flavoring, although ill adapted for the purpose, and fatal accidents have resulted. The smallest quantity known to have produced fatal effects is stated by Taylor to be seventeen drops; the largest quantity from which the patient recovered thirty minims. The importance, therefore, of purifying it is evident. The usual almond, ratassia or peach kernel flavor, is made by dissolving one part of the oil in seven or nine parts of rectified spirit. I prefer the latter proportion, and the essence is more manageable, and should be mixed in the convenient proportion of one drop of essence to one ounce of liquid to be flavored. In order to purify the oil, and to do away with the danger attendant on its use in the crude state, it is recommended to distil it from a mixture of proto-chloride of iron, lime and water. To these ingredients Mr. Redwood adds peroxide of mercury, and states, that without this the whole of the acid is not removed. The mixture cannot be distilled from a glass retort, on account of the violent burnings that would occur—a copper or other metal still is indispensable for the purpose. On account of the troublesome nature of the operation, the loss sustained, and, above all, the fact that nine chemists out of ten do not possess

a metal still of the proper dimensions, the oil is rarely purified. These considerations acted forcibly on myself, and induced me to attempt the purification of the essence by means within the reach of all; and I think I have succeeded in doing so. The process is not altogether novel, being a modification of the well-known iron-test for prussic acid. I at first mixed with the essence a solution of the proto and perchlorides of iron, which are both soluble in spirit, then a slight excess of liq. potassæ, and finally sufficient dilute sulphuric acid to neutralize that excess. I found this to separate considerable quantity of Prussian blue, but that it did not remove the whole of the prussic, although the proportions of the ingredients were varied very many times. I at last prepared three quantities, in the first of which the acid predominated, the second was neutral, the third strongly alkaline. All three were exposed in small flasks in the laboratory window, and agitated occasionally for two days. In the meantime the first had assumed a bright blue, which had increased from the first, and gave promise of complete purification; the second and third were of an olive-green. As therefore the protoxide was just disappearing, and fearful that oxidation would commence, they were rendered neutral by sulphuric acid, and after a short time filtered. The third was the only one found to be quite free from prussic acid, viz., that in which the alkali had been in excess. From my experiments I deduce the following formula.

Make a solution of protochloride of iron by adding an excess of iron wire to the dilute hydrochloric acid of the Pharmacopœia; when the solution has become neutral, add one drachm of it to an ounce of the essence (containing one-tenth by measure of essential oil,) and then twenty-five grs. of potass (the commercial potassa fusa answers the purpose) dissolved in one drachm of distilled water. Shake them well together, and keep the mixture, shaking and opening the vessel occasionally, until it has acquired an olive-brown color, then neutralize with dilute sulphuric acid, and after a short time filter. About six drachms will come through without attention, and a further quantity by tapping with the finger the funnel containing the filter. Let the filter then be washed with spirit, until the required quantity be obtained. Nearly the whole of the water will be retained on the filter by the *hydrated* oxides and the cyanide.

The cost of the process may therefore be summed as the metallic ingredients and ʒiss. of spirit, very trifling, considering the importance of the object. It is very probable that the cost may be still further reduced by diminishing the quantity of iron and potass, but as I have not tried a less quantity, I cannot recommend its adoption. From an ounce of essence thus treated, I obtained, by treating the mass in the filter with hydrochloric acid, ten grains of what appeared to be pure Prussian blue. Considering it is such, and that it does not contain water (although it is stated to contain a small but hitherto unascertained quantity,) assuming also that the spec. grav. of the air is the same as that of water (its real gravity is 1.043, as stated in Turner,) the oil must have contained 11.77 per cent. of prussic acid; but allowing the decimals for the correction of errors, the essence contained previous to treatment 1.1 per cent. of anhydrous prussic acid, being therefore more than half as strong as the P. L. acid. It has been asserted that the pure oil, hydrúret of benzoyle, is more liable to be oxidized to benzoic acid than the crude; if so, it would be advisable to keep it in well-closed vessels. During the process I have not observed anything that would indicate a change, although such, in a small degree, is very possible. I would only add that the essence when carefully treated as described will be obtained without contamination, and rather improved in flavor than otherwise. I trust this or some other equally effectual method may be generally adopted, and the public health no longer jeopardized by the sale for use in flavoring food of that which is a deadly poison.

Mr. Edwards, of Liverpool, thought the subject of the purification of oil of bitter almonds from hydrocyanic acid was one of considerable importance, and that its discussion in the presence of practical and scientific men would be productive of much good. He thought it was not creditable to the state of Pharmacy in this country, that in addition to the variable strength of the hydrocyanic acid of the three British Pharmacopœias, there should be a preparation sold for culinary purposes which was nearly as powerful a poison as the medicinal prussic acid itself. Some persons they mitigated the danger resulting from the use of essence of almonds by making it weaker than the usual strength, but he considered it important that it should be of uniform

strength, otherwise those who had been accustomed to use the weaker preparation in considerable quantity, on being supplied with the stronger, would by using it as before, incur great danger. This danger could only be entirely obviated by purifying the oil from prussic acid. When the subject was brought under the notice of Pharmaceutical Chemists some years ago by Mr. Grindley, of Chester, who was then a pupil in the School of Pharmacy, a large establishment at Liverpool commenced selling essence, prepared with the purified oil, but this was afterwards relinquished, the public giving a preference to the essence made with the crude oil, the flavor of which was considered to be better. He trusted that the subject would now be thoroughly investigated and put upon a more satisfactory footing. With reference to the difficulty experienced in distilling the essential oil in glass vessels, which was referred to in Mr. Grove's paper, he would mention a very easy method of obviating that difficulty, arising from the bumping of the liquid, which was to coat the inside of the glass vessel with silver. This may be very readily done by putting into the vessel a solution of nitrate of silver rendered slightly alkaline with ammonia and boiling it for a few minutes with a little honey. The vessel should not be used for a few days after being thus coated, otherwise the silver would be liable to peel off.

Mr. GREAVES stated, that at the request of Mr. Whipple he had tried the effect of the essential oil purified by the process described in this paper. He administered forty minims to a cat, and more than a fluid drachm to a small dog, and in neither case were the effects different from those which any ordinary essential oil would produce, and from which the animals soon recovered.

Dr. NORMANDY observed that experiments on the effects of poisons were frequently made with rabbits, but these animals were, from a peculiarity of their organization, quite unsuited for such experiments. These peculiarities sometimes occurred among animals. Thus it is well known that common parsley was a poison to parrots. The experiments referred to by Mr. Greaves had been judiciously made upon cats and dogs, which animals more nearly represented man in the manner in which they were acted upon by poisons.

Mr. PEDLER thought it more important to effect the purification of the oil than than the essence of almonds, the latter

being so much diluted with spirit as greatly to diminish the danger attending its use.

Dr. NORMANDY could not assent to the last observation. He thought the essence the more dangerous preparation of the two, from its being more palatable, and therefore more likely to be drank. A case had come under his observation in which a servant, finding a bottle of the essence, which he mistook for noyeau, was instantly killed from tasting it.

Mr. ALLCHIN said, as the difficulty attending the distillation of the oil in glass vessels, for the purpose of purifying it, had been alluded to, he might mention that he had found a very easy means of preventing the bumping of the liquid to consist in adding common salt to the liquid, so as to increase the density of the aqueous part.

Mr. REDWOOD thought that something still remained to be determined experimentally, before the subject under the notice of the Meeting could be considered to be satisfactorily settled. It was certainly very desirable that oil of bitter almonds and its preparations, which were principally used for flavoring articles of diet, should be rendered innocuous by the separation of the hydrocyanic acid which the crude oil contained, but it was also important, and indeed essential to the successful application of any process of purification, that the product should retain the true almond flavor, and that it should be sufficiently permanent to admit of its being kept for a reasonable time. Some of the processes which had been proposed for the purpose, did not completely remove the hydrocyanic acid, and this would perhaps serve to explain the differences of opinion which had prevailed with reference to the effects of the purified oil. There was reason to believe that the hydrocyanic acid existed in the crude oil so that Prussian blue was no longer formed in the usual way, if the purified oil was kept for some time, free hydrocyanic acid again appeared. Some of the processes which had been suggested, however, completely removed the whole of the poisonous ingredient, and the oil was then perfectly innocuous, but after being thus purified, it was found to be much more susceptible of oxidation than when in its crude state, indeed, so much so, as greatly to diminish its value as a flavoring substance. The purified essence, after a time, became little else than a solution of

benzoic acid, and no wonder, under such circumstances, that the public preferred the preparations they had been accustomed to, which were not so liable to change. He (Mr. R.) considered that the great desideratum at present was to give the purified oil (the hyduret of benzoyle) a degree of permanence equal to that of the crude or unpurified oil.—*Transactions of the Pharmaceutical Society, April 5th*, 1854.

ON THE DEODORIZING AND DISINFECTING PROPERTIES OF CHARCOAL, WITH THE DESCRIPTION OF A CHARCOAL RESPIRATOR FOR PURIFYING THE AIR BY FILTRATION.

By John Stenhouse, LL.D., F.R.S.

The powerful effects of freshly-burned wood-charcoal, especially when coarsely powdered, in absorbing gases and vapors, have been long known. Hence the limited extent to which charcoal has been occasionally employed to sweeten fœtid water and animal substances in the incipient stages of putrefaction. Sufficient attention has not, I think, however, been hitherto bestowed on a second and still more important effect which charcoal exerts upon those complex products of decomposition, viz. that of rapidly oxidizing them and resolving them into the simplest combinations they are capable of forming.

When coals or wood are burned with an inadequate supply of air, a variable amount of intermediate or secondary products is generated, constituting what are called soot and smoke; when, on the other hand, the combustion of the fuel is conducted with an adequate supply of oxygen and a sufficiently high temperature, carbonic acid, water, ammonia, with perhaps a little nitric acid, are almost the sole products.

The putrefaction of animal and vegetable substances is likewise in general a process of imperfect oxidation. Hence, under ordinary circumstances, when this is the case, a variety of more or less complex secondary products is formed, which usually possess very disagreeable odors, and exert exceedingly injurious effects upon the animal economy. To these substances the general name of *miasmata* has been given. Not much is known of their nature; but they are believed to be heavy, complex, nitrogenated vapors, which are decomposed by oxygen, chlorine, sulphurous acid, nitric acid, and other disinfecting agents.

My attention was particularly drawn to the importance of charcoal as a disinfecting agent by my friend John Turnbull, Esq., of Glasgow, the well-known extensive chemical manufacturer. Mr. Turnbull, about nine months ago, placed the bodies of two dogs in a wooden box, on a layer of charcoal-powder of a few inches in depth, and covered them over with a quantity of the same material. Though the box was quite open, and kept in his laboratory, no effluvium was ever perceptible; and on examining the bodies of the animals at the end of six months, scarcely anything remained of them except their bones. Mr. Turnbull sent me a portion of the charcoal-powder which had been most closely in contact with the bodies of the dogs. I submitted it for examination to one of my pupils, Mr. Turner, who found it contained comparatively little ammonia, not a trace of sulphuretted hydrogen, but very appreciable quantities of nitric and sulphuric acids, with acid phosphate of lime.

Mr. Turner subsequently, about three months ago, buried two rats in about 2 inches of charcoal-powder, and a few days afterwards the body of a full-grown cat was similarly treated. Though the bodies of these animals are now in a highly putrid state, not the slightest odor is perceptible in the laboratory.

From this short statement of facts, the utility of charcoal-powder, as a means of preventing noxious effluvia from churchyards and from dead bodies in other situations, such as on board ship, is sufficiently evident. Covering a churchyard to the depth of from 2 to 3 inches with coarsely powdered charcoal, would effectually prevent any putrid exhalations ever finding their way into the atmosphere. Charcoal-powder also greatly favors the rapid decomposition of the dead bodies with which it is in contact, so that in the course of six or eight months little is left except the bones.

In all the modern systems of chemistry, such, for instance, as the last edition of Turner's 'Elements,' charcoal is described as possessing antiseptic properties, while the very reverse is the fact. Common salt, nitre, corrosive sublimate, arsenious acid, alcohol, camphor, creosote, and most essential oils are certainly antiseptic substances, and therefore retard the decay of animal and vegetable matters. Charcoal, on the contrary, as we have just seen, greatly facilitates the oxidization, and consequently

the decomposition, of any organic substances with which it is in contact. It is, therefore, the very opposite of an antiseptic.

The object of the present paper, however, is chiefly an application of the absorbent and oxidizing properties of charcoal, which, so far as I am aware, has never yet been proposed, viz. to employ a new species of respirator, filled with powdered animal charcoal, to absorb and destroy any miasmata or infectious particles present in the air in the case of fever and cholera hospitals, and of districts infected by ague, yellow fever, and similar diseases. I have got such a respirator made by Ferguson and Sons, Smithfield, instrument-makers to St. Bartholomew's Hospital. It fits closely to the lower portion of the face, extending from the chin to within half an inch of the eyes, and projects about an inch on either side of the mouth. It therefore includes the nostrils as well as the mouth. The frame of the respirator is made of thin sheet copper, but the edges are formed of lead, and are padded and lined with velvet, so that it can be made to fit tightly to the face. The powdered charcoal is kept in its place by means of two sheets of fine wire gauze, from a quarter to an eighth of an inch apart. As the body of the apparatus is metallic, it has been electro-plated with silver. Electro-plating the respirator with platinum or gold would certainly be an improvement. There is a small opening closed with a wire-gauze screw, by means of which the respirator can be filled with charcoal or emptied at pleasure. The respirator is kept in its place by an elastic band passing round the back part of the head. I have employed *animal* charcoal as the more porous substance, but I should think wood-charcoal would answer perfectly well.* The object in view is, by filtering the air through such a porous substance as animal charcoal, to intercept the miasmata which may have got mixed with it. These, I think, cannot fail to be absorbed by the pores of the charcoal, where they will be rapidly oxidated and destroyed by the condensed oxygen with which they will be brought into the most intimate contact. The probability of this expectation being realized is greatly strengthened by the results of repeated trials with the respirators on certain noxious and offensive gases,

* Since the above was written, I have ascertained by experiment that common wood-charcoal is even more efficacious than animal charcoal.—J. S.

such as ammonia, sulphuretted hydrogen, hydrosulphate of ammonia and chlorine. I have found that air strongly impregnated with these gases, and which could not be respired for any length of time under ordinary circumstances, may be breathed with impunity when the charcoal respirator is worn, the odor of these gases being rendered almost, if not altogether, imperceptible. Any other highly porous substance, such for instance as sponge platinum, or pounded pumice-stone, might probably be found to answer perfectly well for filling the respirator; but I have selected charcoal as the cheapest and most easily available material.

While the filtration of water through charcoal powder and other porous substances has been advantageously practised for many centuries, the object in view being to deprive the water of numerous impurities diffused through it, which produce injurious effects on the animal economy, it is certainly somewhat remarkable that the very obvious application of a similar proceeding to the lighter fluid in which we live, viz. air, which not unfrequently contains even more noxious impurities floating in it than are usually present in water, should have, up to the present time, been so unaccountably overlooked.

In addition to the precaution of wearing such a respirator as that just described, persons necessitated to live in especially pestiferous districts might have their houses made as air-tight as possible, with the exception of such openings as are necessary to maintain a proper amount of ventilation. By means of these openings the air could be freely admitted through gauze into which the requisite quantity of charcoal had been quilted. The doors of such houses could also be made double, and be constructed of coarse cloth, likewise containing a thin layer of charcoal powder. As an additional precaution, if it were thought desirable, the walls, floors, and ceilings of houses in very unhealthy districts could be easily lined with mattrasses filled with a couple of inches of charcoal powder. Were these and similar precautions adopted, I confidently anticipate that Europeans will be enabled to reside with comparative impunity in some of the hitherto most pestilential districts in the world.—*Chem. Gaz.* April 1854, from *Journal of the Society of Arts*, Feb. 24, 1854.

ON THE CINCHONA BARKS OF NEW GRANADA.

By Ezequiel Uricoechea, of Bogota.

The increasing commerce in the Cinchona barks of New Granada, and a desire to contribute something to the knowledge of them, are my reasons for writing these lines.

Much has been lately said of the Bogotá, Cinchona bark (*China Bogotensis*,) in which the new base *quinidine* has been found. As the new alkaloid differs from quinine, and was thought to be much inferior to it in medicinal properties, there was a check on the commerce in the Cinchona barks coming from New Granada, all of them passing under the name of *China Bogotensis;* more recently, however, considerable quantities have been exported to England. That the barks which *now* come from that country differ from one another, I hope to show in what follows, for of the *old* cinchona trees from New Granada, it is too well known that there were a great many species, the barks of which were then exported.

Having received by private means, and not through a mercantile house, seven specimens of bark direct from Bogotá, Professor Wiggers, of Göttingen, had the kindness to examine them; and as I have had the opportunity of comparing them with other known specimens in his possession, I entertain no doubt of the correctness of his determination.

In addition to the barks I obtained an ounce of the sulphate of quinine made by Manuel Umana and Co., in the Tequendama manufactory, regarding a qualitative analysis of which I may be permitted a few lines.

1. *China pseudoregia.* From *Chipaque*, sixteen leagues from Bogotá. There are some seven subordinate barks that come under this name. According to Reichel's analysis it contains per cent.—quinine, 1.01, cinchonine, 0.63,quinic acid, 1.29.

2. *China flava dura.* From *Suaque*, ten leagues from Bogotá. This cinchona contains, according to Pelletier and Caventou, the discoverers of quinine, and to whom we owe the first scientific investigations of these barks, quinate of quinine and of cinchonine.

3. *China Cartagena.* From *Chipaque.* Here we see, that in the same place there are two kinds of bark collected—this and the *pseudoregia;* and probably in the woods trees of very differ-

ent species grow by each other, so that these specific names taken from localities are worse than none, for they confuse instead of clear up the subject. This Cinchona bark is but a variety of the *China flava dura*.

4. *China Bogotensis*. From *Fusagasugá*, eight leagues from Bogotá. Of the whole number of specimens that I obtained, this is the only one which has been recognized as the Bogotá bark, which has given rise to so many contradictory views with respect to the bases which it contains.

5. *China rubiginosa*. Found ten leagues from Bogotá.

6. *China rubiginosa*. From *El Acerradero*, also ten leagues distant. Having these two specimens, I am able to give the locality of this bark, until now unknown. We can therefore say with certainty, that it comes from New Granada, and that M. Von Bergen was right when he asserted that this bark was exported thence, although it can also be said that the same species has come from and is produced at Cusco, in Peru.

The chemical constitution has been but little studied: from an imperfect analysis it appears to contain—according to Franck—in 100 pounds, forty-eight to fifty ounces of cinchonine. The large quantity of cinchonine here found is improbable.

7. *China rubiginosa*. From New Granada, exact locality unknown.

Sulphate of Quinine of the Tequendama Manufactory. It is very white, porous, and crystallized in small needles, the planes of which possess a vitreous lustre. By the well known test with ammonia and sulphuric ether, the solution of the salt was so complete, that the very small quantity that remained between the two liquids was only extraneous matter. The ethereal solution was allowed to evaporate, and it left only a residue of amorphous quinine, with no traces of crystals, which well proves the absence of quinidine. By this test then, we have to consider the sulphate of quinine manufactured in New Granada as on a parallel with similar European preparations.

Résumè. We find from what precedes, or at least we have good reason to suppose, that the seeming contradictions which have been published about the Cinchona bark of Bogotá and of its chemical constitution, are easily accounted for by considering the varieties of bark coming into commerce under the same name

from the same district. Secondly, that the barks that are now-a-days exported from New Granada are not all *China Bogotensis*, but are so different from one another, that we must acknowledge that they come from different trees; a few of these barks, those growing in the plateau of Bogotá or its vicinity, I have noticed above. And further, that *because* the barks come from New Granada they should not be underrated, for they contain some of the best sorts. Schäuffele and Bouquet have shown, that some barks obtained by them direct from the exporter Lopez, of New Granada, are as rich in quinine and cinchonine as the *China calisaya vera*, while naturally, others are not so rich and some are poor ones.

Finally, with regard to the composition of the impure sulphate of quinine of New Granada, it must be expected to vary, and much, according to the *different* kinds of bark employed at this or that time of manufacturing. However, the sulphate of quinine, such as given by the manufactory of Taquendama to-day is quite pure; and it is with no small degree of pleasure that I can say, that our country not only produces the source of the renowned *specific*, but the men and the mind to preserve it, and to distribute it to our fellow-creatures.—*Pharmaceutical Journal, April 1, 1854.*

THE MANUFACTURE OF PYROGALLIC ACID.

By H. Gruneberg.

As the material for the manufacture of pyrogallic acid, I employ Chinese galls, which are coarsely powdered, twice extracted with boiling of water, and then expressed. The extract obtained is evaporated to dryness, and pulverized. It amounts to rather more than 30 pounds for every 50 pounds of gall treated.

As the apparatus I use a flat basin of sheet iron, whose bottom has a diameter of 18 inches, with an upright rim 3 inches high. At a height of 1½ inch from the bottom of the dish, the rim bears at the external side a tube an inch long, and an inch in diameter, directed somewhat upwards, which communicates with the interior of the dish, and serves to receive a thermometer, by means of a cork.

At the bottom of the dish half a pound of the pulverized ex-

tract is evenly spread, then the thermometer is placed somewhat near, so that its bulb reaches nearly to the middle of the apparatus, and half-an-inch from the bottom. The dish is covered with an ordinary piece of gauze, and then with a paper hat, about 15 inches high. The apparatus is placed on a sheet of iron, which is strewed with half-an-inch of dry sand, and this is set on a furnace.

A tolerably strong fire is kept up, until the thermometer rises to about 295° Fahr., upon which the heat must be quickly moderated. The thermometer soon raises to about 390°, and the acid rapidly sublimes. The latter temperature is maintained for three hours; and after this time a considerable quantity of colorless pyrogallic acid is found in the hat. By this method 50 pounds of Chinese galls will yield 2 pounds of pyrogallic acid. —*Annals of Pharm. from Journal für Praktische Chemie.*

THE FORMATION OF SULPHOCYANURET OF POTASSIUM IN THE WET WAY.

By Dr. Lowe.

When a watery solution of a weighed quantity of ferrocyanuret of potassium is mixed with sulphuret of potassium in the usual proportions, or with sulphur and carbonate of potash, and the mixture heated to boiling, the solution, after a few minutes, becomes greenish, under the separation of sulphuret of iron, the quantity of which increases according to the length of the boiling of the liquid. After long-continued boiling, all the ferrocyanuret of potassium is completely replaced by the sulphocyanuret of potassium. If the suspended sulphuret of iron is now separated by filtration from the fluid, the latter allowed, in case it should be still colored yellow, to stand in the air a short time until it is colorless, the whole evaporated to dryness in a water-bath, and the residue extracted with alcohol, a tolerably saturated alcoholic solution of sulphocyanuret of potassium is thus obtained. The residue insoluble in alcohol contains very small quantities of ferrocyanuret of potassium, whose decomposition and conversion should be effected by further boiling. A solution of ferrocyanuret of potassium, boiled with sulphur alone, is converted into sulphocyanuret of potassium, under the simul-

taneous separation of sulphuret of iron, which appears to color the suspended sulphur black, still the quantity of sulphocyanuret of potassium resulting therefrom is, even after continued boiling, very inconsiderable.—*Ibid from Ibid.*

FLUID MAGNESIA.

By Dr. Thomas Antisel.

This medicament, introduced to the profession by Sir James Murray, and generally adopted, is at all times manufactured of very variable strength. By Sir J. M., who held a patent for its manufacture in Great Britain and Ireland, it was stated to be furnished at the strength of 14 grains to the ounce. Its manufacture being commenced in this city about a year since, and having received a bottle from the manufacturers, I determined the amount of solid matter and of magnesia which a given quantity would yield.

1. On evaporating one ounce of fluid to dryness the residue being ignited in a porcelain crucible, weighed 4.50 grains.

2. Digested 1 oz. for an hour to expel the carbonic acid, which precipitated a portion of the magnesia; then added caustic potass until the precipitation ceased; precipitate collected, dried, ignited, and weighed = 4.33.

3. The residue of experiment 1, treated with weak hydrochloric acid, did not wholly dissolve, but left a white gritty powder to 15; this dissolved in boiling hydrochloric acid, and on evaporation to dryness and ignition, it was insoluble in the same acid; this portion was silica.

Now, as 100 parts of ordinary carbonate of magnesia contain 41.6 of caustic magnesia (MgO), so from experiment 2, 4.33 gr. would supply 10.41 grains of carbonate of magnesia in 1 oz. of liquid. This "American Fluid Magnesia," as it is termed, does not, therefore, contain the full amount of magnesia, which the condensed gas would dissolve, by nearly one-third.

Since the solvent powers of carbonic acid upon the earths have been so happily introduced into medicine, it is worth considering whether a solution of phosphate of lime in carbonic acid might not be used with advantage.—*N. Y. Jour. of Pharm.*

Varieties.

On Perfumery. By Septimus Piesse.

(Continued from page 279.)

Cassia.—The essential oil of cassia is produced by distilling the outer bark of the *Cinnamomum cassia*. 1 cwt. of bark yields rather more than three quarters of a pound of oil; it has a pale yellow color; in smell it much resembles cinnamon, although very inferior to it. It is principally used for perfuming soap, especially what is called "military soap," as it is more aromatic or spicy than flowery in odor; it therefore finds no place for handkerchief use.

Caraway.—This odoriferous principle is drawn by distillation from the seeds of the *Carum carui*. It has a very pleasant smell, quite familiar enough without description. It is well adapted to perfume soap, for which it is much used in England, though rarely, if ever, on the continent; when dissolved in spirit it may be used in combination with oil of lavender and bergamot for the manufacture of cheap essences, in a similar way to cloves (see *Cloves*). If caraway seeds are ground, they are well adapted for mixing to form sachet powder (see *Sachets*).

Cascarilla.—The bark alone of this plant is used by the manufacturing perfumer, and that only in the fabrication of pastilles. The *Cascarilla gratissimus* is however so fragrant, that Burnett says its leaves are gathered by the Koras of the Gape of Good Hope as a perfume, and both the *C. fragrans* and *C. fragilis* are odoriferous. It behoves perfumers, therefore, who are on the look out for novelties, to obtain these leaves, and ascertain the result of their distillation.

Messrs. Herring and Co., some years ago, drew the oil of cascarilla, but it was only offered to the trade as a curiosity.

Cedar Wood now and then finds a place in a perfumer's warehouse; when ground it does well to form a body for sachet powder. Slips of cedar wood are sold as matches for lighting lamps, because while burning an agreeable odor is evolved; some people use it also in this condition, distributed among clothes and drawers to "prevent moth." On distillation it yields an essential oil, but it is little if ever used.

The tincture smells agreeably of the wood, from which it can readily be made. Its crimson color, however, prohibits it from being used for the handkerchief. It forms an excellent tincture for the teeth, and is the basis of the celebrated French dentifrice "eau botot."

Cedrat.—This perfume is procured from the rind of the citron fruit (*Citrus medica*), both by distillation and expression; it has a very beautiful lemony odor, and is much admired. It is principally used in the manu-

facture of essences for the handkerchief, being too expensive for perfuming grease or soap. What is called extract of cedrat is made by dissolving two ounces and a half of the above essential oil of citron in one gallon of spirits, to which some perfumers add half an ounce of bergamot.

Cinnamon.—Several species of the plant *Laurus cinnamomum* yields the cinnamon and cassia of commerce. Its name is said to be derived from *China amomum*, the bark being one of the most valued spices of the East. Perfumers use both the bark and the oil, which is obtained by distillation from it. The bark ground enters into the composition of some pastilles, tooth powders and sachets. The essential oil of cinnamon is principally brought to this country from Ceylon; it is exceedingly powerful and must be used sparingly. If such compounds as cloves answer, so will cinnamon.

Citron.—On distilling the flowers of the *Citrus medica*, a slightly fragrant oil is procured, which is a species of neroli, and is principally consumed by the manufacturers of eau de Cologne.

Citronella.—Under this name there is an oil in the market, chiefly derived from Ceylon and the East Indies; its true origin we are unable to decide; in odor it somewhat resembles citron fruit, but is very inferior. Probably it is procured from one of the grasses of the *Andropagon* genus. Being cheap it is extensively used for perfuming soap. What is now extensively sold as "honey" soap, is a fine yellow soap slightly perfumed with this oil. Some few use it for scenting grease, but it is not much admired.

Cloves.—Every part of the clove plant (*Carophyllus aromaticus*) abounds with aromatic oil, but it is most fragrant and plentiful in the unexpanded flower bud, which are the cloves of commerce. Cloves have been brought into the European markets for more than 2,000 years. The plant is a native of the Moluccas and other islands in the Chinese seas. "The average annual crop of cloves is, from each tree, 2 or 2½ lbs., but a fine tree has been known to yield 125 lbs. of this spice in a single season, and as 5,000 cloves only weigh one pound, there must have been at least 625,000 flowers upon this single tree." (Burnett.)

The oil of cloves may be obtained from the fresh flower buds, but the usual method of procuring it is by distillation, and which is carried on to a very great extent in this country. Few essential oils have a more extensive use in perfumery than that of cloves; it combines well with grease, soap, and spirit, and, as will be seen in the recipes for the various bouquets given hereafter, it forms a leading feature in some of the most popular handkerchief essences, Rondeletia, the Guard's Bouquet, &c., and will be found where least expected. For essence of cloves, dissolve oil of cloves in the proportion of two ounces of oil to one gallon of spirit.

Dill.—Perfumers are now and then asked for "dill water;" it is, however, more a druggist's article than a perfumer's, as it is more used for its medicinal qualities than for its odor, which, by the way, is rather pleasant

than otherwise. Some ladies use a mixture of half dill water and half rose water, as a simple cosmetic, "to clear the complexion."

The oil of dill is procured by submitting the crushed fruit of dill (*Anethum graveolens*) with water to distillation. The oil floats on the surface of the distillate, from which it is separated by the funnel in the usual manner; after the separation of the oil, the "water" is fit for sale. Oil of dill may be used with advantage, if in small proportions, and mixed with other oils, for perfuming soap.

Eglantine, or Sweet Briar, notwithstanding what the poet Robert Noyes says—

"In fragrance yields,
"Surpassing citron groves or spicy fields,"

does not find a place in the perfumer's "scent-room" except in name. This, like many other sweet scented plants, does not repay the labor of collecting its odor. The fragrant part of this plant is destroyed, more or less, under every treatment that it is put to, and hence is discarded. As, however, the article is in demand by the public, a species of fraud is practised upon them, by imitating it thus:—

Imitation Eglantine, or Essence of Sweet Briar.

Spirituous extract of French rose pomatum . . .	1 pint.
" " cassie	½ "
" " fleur d'orange	¼ "
Esprit de rose	¼ "
Oil of neroly	½ drachm.
Oil of lemon grass (verbena oil)	½ "

Elder (*Sambucus nigra*).—The only preparation of this plant for its odorous quality used by the perfumer, is elder-flower water. To prepare it, take nine pounds of elder-flowers, free from stalk, and introduce it to the still with four gallons of water; the first three gallons that come over is all that need be preserved for use; one ounce of rectified spirit should be added to each gallon of "water" distilled, and when bottled is ready for sale. Other preparations of elder-flowers are made, such as milk of elder, extract of elder, &c., which will be found in their proper places under Cosmetics. Two or three new materials made from this flower will also be given hereafter, which are likely to meet with a very large sale on account of the reputed cooling qualities of the ingredients; of these we would call attention more particularly to cold cream of elder flowers, and to elder oil for the hair.

The preparation of elder-flowers, if made according to the Pharmacopœias, are perfectly useless, as the forms therein given are quite absurd, and show an utter want of knowledge of the properties of the materials employed; we must, therefore steer clear of the Pharmacopœias, in our manufacture of elder-flower cosmetics.

Fennel (*Feniculum vulgare*).—Dried Fennel herb, when ground, enters

into the composition of some sachet powders. The oil of fennel, in conjunction with other aromatic oils, may be used for perfuming soap. It is procurable by distillation.

Flag-sweet (*Acorus calamus*).—The roots, or rizome, of the sweet flag, yield by distillation a pleasant smelling oil; 1 cwt. of the rizome will thus yield one pound of oil. It can be used according to the pleasure of the manufacturer in scenting grease, soap, or for extraits, but requires other sweet oils with it to hide its origin.

Geranium (*Pelargonium odoratissimum*), rose-leaf geranium.—The leaves of this plant yield by distillation a very agreeable rosy-smelling oil, so much resembling real otto of rose that it is used very extensively for the adulteration of that valuable oil, and is grown very largely for that express purpose. It is principally cultivated in the South of France, and in Turkey (by the rose-growers). In the department of the Seine-et-Oise, at Montfort-Lamaury, in France, hundreds of acres of it may be seen growing. 1 cwt. of leaves will yield about two ounces of essential oil. Used to adulterate otto of rose, it is in its turn itself adulterated with ginger grass oil (*Andropagon*), and thus formerly was very difficult to procure genuine; on account of the increased cultivation of the plant, it is now, however, easily procured pure. Some samples are greenish colored, others nearly white, but we prefer that of a brownish tint.

When dissolved in rectified spirit, in the proportion of about three ounces to the gallon, it forms the "extract of rose-leaf geranium" of the shops. A word or two is necessary about the oil of geranium, as much confusion is created respecting it, in consequence of there being an oil under the name of geranium, but which in reality is derived from the *Andropagon nardus*, cultivated in the Moluccas. This said andropagon (geranium!) oil can be used to adulterate the true geranium, and hence we suppose its nomenclature in the drug markets. The genuine rose-leaf geranium oil is fetching about 8*s*. per ounce, while the andropagon oil is not worth more than half that sum per pound. And we may observe here, that the perfuming essential oils are best purchased through the wholesale perfumers, as from the nature of their trades they have a better knowledge and means of obtaining the real article than the drug broker. On account of the pleasing odor of the true oil of rose-leaf geranium, it is a valuable article for perfuming many materials, and it appears to give the public great satisfaction.

Heliotrope.—Either by maceration or en-fleurage with clarified fat, we may obtain this fine odor from the flowers of the *Heliotrope Peruvianum* or *H. grandiflorum*. Exquisite as the odor of this plant is, at present it is not applied to use by the manufacturing perfumer. This we think rather a singular fact, especially as the perfume is powerful and the flowers abundant. We should like to hear of some experiments being tried with this plant for procuring its odor in this country, and for that purpose now suggest the mode of operation which would most likely lead to successful re-

sults. For a small trial in the first instance, which can be managed by any person having the run of a garden, procure an ordinary glue pot now in common use, which melts the material by the boiling of water; it is in fact a water bath, in chemical parlance; one capable of holding a pound or more of melted fat. At the season when the flowers are in bloom obtain half a pound of fine mutton suet, melt the suet and strain it through a close hair-sieve, allow the liquefied fat as it falls from the sieve to drop into cold spring water; this operation granulates and washes the blood and membrane from it. In order to start with a perfectly inodorous grease, the melting and granulation process may be repeated three or four times; finally, remelt the fat and cast it into a pan to free it from adhering water. Now put the clarified suet into the macerating pot, and place it in such a position near the fire of the greenhouse or elsewhere that will keep it warm enough to be liquid; into the fat throw as many flowers as you can, and there let them remain for twenty-four hours; at this time strain the fat from the spent flowers and add fresh ones; repeat this operation for a week; we expect at the last straining the fat will have become very highly perfumed, and when cold may be justly termed *Pomade à la Heliotrope.*

The cold pomade being chopped up, like suet for a pudding, is now to be put into a wide-mouth bottle, and covered with spirits as highly rectified as can be obtained, and left to digest for a week or more; the spirit then strained off will be highly perfumed; in reality it will be *extract of heliotrope,* a delightful perfume for the handkerchief. The rationale of the operation is simple enough; the fat body has a strong affinity or attraction for the odorous body, or essential oil of the flowers, and it, therefore, absorbs it by contact and becomes itself perfumed. In the second operation, the spirit has a much greater attraction for the fragrant principle than the fatty matter; the former, therefore, becomes perfumed at the expense of the latter. The same experiment may be repeated with almond oil substituted for the fat.

The experiment here hinted at, may be varied with any flowers that there are to spare; indeed, by having the macerating bath larger than was mentioned above, an excellent *millefleur* pomade and essence might be produced from every conservatory in the kingdom, and thus we may receive another enjoyment from the cultivation of flowers beyond their beauty of form and color.

We hope that those of our readers who feel inclined to try experiments of this nature will not be deterred by saying, "they are not worth the trouble," as we affirm this to be incorrect. It must be remembered, that very fine essences realize in the London perfumery warehouses 24s. per pint of sixteen ounces, and that fine *flowery-scented* pomades fetch the same sum per pound. Heliotrope, and many other sweet scented plants, are just now coming into season; and if the experiments are successful they should

be published, as then we may hope to establish a new and important manufacture in this country. But we are digressing.

The odor of heliotrope resembles a mixture of almonds and vanilla, and is well imitated thus:

Extract of Heliotrope.

Spirituous extract of	vanilla	½ pint.
" "	French rose pomatum	½ "
" "	orange flower pomatum	2 oz.
" "	ambergris	1 oz.
Essential oil of almonds		5 drops.

A preparation made in this manner under the name of *Extrait de Heliotrope* is that which is sold in the shops of Paris and London, and is really a very nice perfume, passing well with the public for a genuine extract of heliotrope.

Hovenia.—A perfume under this name is sold to a limited extent, but if it did not smell better than the plant *Hoveniæ dulcis et inequalis*, a native of Japan, it would not sell at all. The article in the market is made thus:

Rectified spirit	1 quart.
Rose water	½ pint.
Essential oil of lemons	½ oz.
Otto of rose	1 drachm.
Oil of cloves	½ "
" neroly	10 drops.

After filteration it is ready for sale. When compounds of this kind do not become bright by passing through blotting-paper, the addition of a little carbonate of magnesia effectually clears them. The water in the above recipe is only added in order that the article produced may be retailed at a moderate price, and would, of course, be better without that "universal friend."

Honeysuckle or Woodbine.—

> "Copious of flower the woodbine, pale and wan,
> But well compensating her sickly looks
> With never-cloying odors."

What the poet Cowper here says is quite true, nevertheless, it is a flower that is not used in practical perfumery, though there is no reason for abandoning it. The experiments suggested for obtaining the odor of Heliotrope and Millefleur (thousand flowers) are also applicable to this, as also to Hawthorne. A good Imitation of Honeysuckle is made thus:—

Spirituous extract of	rose pomatum	1 pint.
" "	violet "	1 "
" "	tubereuse "	1 "
Extract of vanilla		¼ "
" tolu		¼ "
Oil of neroli		10 drops.
Essential oil of almonds		5 "

The prime cost of a perfume made in this manner would probably be too high to meet the demand of a retail druggist; in such cases it may be diluted with rectified spirit to the extent "to make it pay," and will yet be a nice perfume. The formula generally given herein for odors is in anticipation that when bottled they will retail for at least eighteenpence the fluid ounce! which is the average price put on the finest perfumery by the manufacturers of London and Paris.

JASMIN.—

"Luxuriant above all,
The Jasmin throwing wide her elegant sweets."

This flower is one of the most prized by the perfumer. Its odor is delicate and sweet, and so peculiar that it is without comparison, and as such cannot be imitated. When the flowers of the *Jasminidæ odoratissimum* are distilled, repeatedly using the water of distillation over fresh flowers, the essential oil of jasmin may be procured. It is, however, exceedingly rare, on account of the enormous cost of production. There was a fine sample of six ounces exhibited in the Tunisian department of the Crystal Palace, the price of which was 9*l.* the fluid ounce! The plant is the Yasmyn of the Arabs, and from which our name is derived.

In the perfumer's laboratory the method of obtaining the odor is by absorption, or, as the French term it, *enfleurage;* that is, by spreading a mixture of pure lard and suet on a glass tray, and sticking the fresh-gathered flowers all over it, leaving them to stand a day or so, and repeating the operation with fresh flowers—the grease absorbs the odor. Finally the pomade is scraped off the glass or slate, melted at as low a temperature as possible, and strained.

Oils, strongly impregnated with the fragrance, are also prepared much in the same way. Layers of cotton wool, previously steeped either in olive oil or oil of ben (obtained by the pressure from the blanched nuts of the *Moringa oleifera*), are covered with jasmin flowers, which is repeated several times; finally, the cotton or linen cloths, which some perfumers use, are squeezed under a press. The jasmin oil thus produced is the *Huile antique au jasamin* of the French houses.

The "extract of jessamine" is prepared by pouring rectified spirit on the jasmin pomade or oil, and allowing them to remain together for a fortnight at a summer heat. The best quality extract requires two pounds of pomatum to every quart of spirit. The same can be done with the oil of jasmin. If the pomade is used, it must be cut up fine previously to being put into the spirit: if the oil is used, it must be shaken well together every two or more hours, otherwise, on account of its specific gravity, the oil separates, and but little surface is exposed to the spirit. After the extract is strained off, the "washed" pomatum or oil is still useful, if re-melted, in the composition of pomatum for the hair, and gives more satisfaction to a customer than any of the "creams and balms," &c., &c., made up and scented with essential oils; the one smells of a flower, the other "a nondescript."

The extract of jasmin enters into the composition of a great many of the most approved handkerchief perfumes sold by the English and French Perfumers. Extract of jasmin is sold for the handkerchief often pure, but is one of those scents which, though very gratifying at first, becomes what people call "sickly" after exposure to the oxidizing influence of the air, but if judiciously mixed with other perfumes of an opposite character is sure to secure the most fastidious customer.

JONQUIL.—The Parisian perfumers sell a mixture which they call "extract of jonquil." The plant, however, only plays the part of a godfather to the offspring, giving it its name. The so called jonquil is made thus:

Spirituous extract of jasmin pomade . .	1 pint.
" " of tubereuse " . .	1 pint.
" " of fleur d'orange . .	½ pint.
Extract of vanilla	2 fluid ounces.

LAUREL.—By distillation from the berries of the *Laurus nobilis*, and from the leaves of the *Laurus cerasus*, an oil and perfumed water are procurable of a very beautiful and fragrant character. Commercially, however, it is disregarded, as from the similarity of odor to the oil distilled from the bitter almond, it is rarely, if ever, used by the perfumer, the latter being more economical.

LAVENDER.—The climate of England appears to be better adapted for the perfect development of this fine old favorite perfume than any other on the globe. "The ancients employed the flowers and the leaves to aromatize their baths, and to give a sweet scent to water in which they washed; hence the generic name of the plant, *Lavandula*."—*Burnett*.

Lavender is grown to an enormous extent at Mitcham, in Surrey, which is the seat of its production, in a commercial point of view. Very large quantities are also grown in France, but the fine odor of the British produce realizes in the market four times the price of that of Continental growth. Burnett says that the oil of *Lavandula spica* is more pleasant than that derived from the other species, but this statement must not mislead the purchaser to buy the French spike *verœ*. Half a hundred weight of good lavender flowers yield, by distillation, from 14 to 16 oz. of essential oil.

All the inferior descriptions of oil of lavender are used for perfuming soaps and greases; but the best—that obtained from the Mitcham lavender—is entirely used in the manufacture of what is called lavender water, but which, more properly, should be called essence or extract of lavender, to be in keeping with the nomenclature of other essences being prepared with spirit.

The number of formulæ published for making a liquid perfume of lavender is almost endless, but the whole of them may be resolved into essence of lavender, simple; essence of lavender, compound; and lavender water.

There are two methods of making essence of lavender—1. By distilling a

mixture of essential oil of lavender and rectified spirit; and the other—2. By merely mixing the oil and the spirit together.

The first process yields the finest quality; it is that which is adopted by the firm of Smyth & Nephew, whose reputation for this article is such that it gives a good character in foreign markets, especially in India, to all products of lavender of English manufacture. Lavender essence, that which is made by the still, is quite white, while that by mixture only, always has a yellowish tint, and which by age becomes darker and resinous.

Smyth's Lavender.

To produce a very fine distillate, take—

Essential oil of English lavender	4 oz.
Rectified spirit (60 over proof)	5 pints.
Rose water	1 pint.

Mix and distil five pints for sale. Such essence of lavender is expensive, but at 10*s.* a pint of 14 oz.! there *is* a margin for profit. It not being convenient to the general dealer to sell distilled lavender essence, the following form, by mixture, will produce a first-rate article:—

Essence of Lavender.

Essential oil of lavender.	3½ oz.
Rectified spirit	2 quarts.
Rose water	½ pint.
Tincture of orris	½ pint.

If not quite bright, filter the mixture through a little carbonate of magnesia strewed upon an ordinary filtering paper.

The perfumers retail price for such quality, is 8*s.* per pint of 14 oz.

Lavender Water.—Take—

English oil of lavender	4 oz.
Spirit	3 quarts.
Rose water	1 pint.

Filter as above, and it is ready for sale.

Common Lavender Water.—Same form as above, substituting oil of French lavender for the British.

Recipes for Rondeletia, Lavender Boquet, and other lavender compounds, will be given when we come to compound perfumes, which, to be beneficial to the practical reader, will be reserved until we have finished explaining the method of making the simple essences.

Lemon.—This fine perfume is abstracted from the *Citrus limonum*, by expression, from the rind of the fruit. The essential oil of lemons in the market is principally from Messina, where there are hundreds of acres of "lemon groves." Oil of lemons, like all the oils of the Citrus family, is rapidly prone to oxidation when in contact with air and exposure to light; a high temperature is also detrimental, and as such is the case it should be preserved in a cool cellar. Most of the samples from the gas-heated shelves of the druggists' shops are as much like essence of turpentine to the smell

as that of lemons; rancid oil of lemons may, in a great measure, be purified by agitation with warm water and final decantation. When new and good, lemon oil may be freely used in combination with rosemary, cloves, and caraway, for perfuming powders for the nursery. From its rapid oxidation, it should not be used for perfuming grease, as it assists rather than otherwise all fats to turn rancid; hence, pomatums so perfumed do not keep well. In the manufacture of other compound perfumes, it should be dissolved in spirit, in the proportion of six to eight ounces of oil to one gallon of spirit. There is a large consumption of oil of lemons in the manufacture of Eau de Cologne; that Farina uses it is easily discovered by adding a few drops of Liq. Ammoniæ fort. to half an ounce of his Eau de Cologne, the smell of the lemon is thereby brought out in a remarkable manner. Perhaps it is not out of place here to remark, that in attempts to discover the composition of certain perfumes, we are greatly assisted by the use of strong Liq. Pottassæ or Liq. Ammoniæ, certain of the essential oils combining with the alkalies, allow those which do not do so, if present in the compound, to be smelt.

Lemon Grass.—According to Pereira, the essential oil in the market under this name is derived from the *Andropogon schoenanthus*, a species of grass which grows abundantly in India. It is cultivated to a large extent in Ceylon and the Moluccas purposely for the oil, which from the plant is easily procured by distillation. Lemon grass oil, or, as it is sometimes called, oil of verbena, on account of its similarity of odor to that favorite plant, is imported into England in old English porter and stout bottles. It is very powerful, well adapted for perfuming soaps and greases, but its principal consumption is in the manufacture of artificial essence of verbena. From its comparatively low price, great strength, and fine perfume (when diluted), the lemon grass oil may be much more used than at present, with considerable advantage to the retail shopkeeper.

Lilac.—The fragrance of the flowers of this ornamental shrub (*syringa*) is well known. The essence of lilac is obtained either by the process of maceration, or enfleurage with grease, and afterwards treating the pomatum thus formed with rectified spirit, in the same manner as previously described for cassie; the odor so much resembles tubereuse, as to be frequently used to adulterate the latter, the demand for tubereuse being at all times greater than the supply. A beautiful Imitation of Essence of White Lilac may be compounded thus—

Spirituous extract from tubereuse pomade	1 pint.
" of orange flour pomade	½ pint.
Essential oil of almonds	drops
Extract of civet	½ oz.

The civet is only used to give permanence to the perfume of the handkerchief.—*Annals of Pharmacy.* (*To be continued.*)

Acclimation of the Deodar.—In England they are trying an experiment on a large scale worthy of notice. At the instigation of the Government, the East India Company have brought home one ton of seeds of the Deodar, which were gathered on the Himalaya mountains, and which are intended to plant on the hills and ground of the unproductive land of Great Britain. The deodar is the cedar of the Himalayas. The horticulturists are well acquainted with it, but up to this time it has been used as an ornament of the garden merely. The rare elegance of this noble tree is appreciated by every one; it attains a height of sixty-five yards, to two or three yards in diameter. The wood is very hard, and almost incorruptible, as the monuments of traditionally many years old have not been in the least degree injured by time; it resists the action of water to an almost indefinite time. When England shall have replenished their ancient forests with this magnificent tree, she will have gained immense assistance to her maritime interests. It is supposed that the seeds brought by the East India Company will germinate and produce six million trees.—*N. Y. Journal of Pharmacy.*

Artificial Wood.—MM. Barthe and Potin of Paris, have invented a new process for making artificial wood, by the aid of which products are obtained whose beauty is superior, and so like the natural substances as to deceive many. The many varieties of native woods which the inventors make are all composed of gelatine and sawdust, which are worked together and solidified by means of a peculiar process of tanning. This product being brought into a pasty mass can receive all kinds of stamp and variety of form. These stamped articles are on view in Paris, and the eye can scarcely distinguish them from fine specimens of carving in wood.—*Ibid.*

Effect of Intense Cold.—The following account of an Arctic climate upon food is drawn from Dr. Kane's account of the Grinnell Exploring Expedition, lately published.

Such latitudes seem eminently adapted for experiments upon the condensation of gases. We should think that oxygen itself, after a few night's exposure with Dr. Kane, and then treated with solid carbonic acid and ether, would be found melting into tears, and suspect that this would be the legitimate use of a North-west passage:

"All our eatables became laughably consolidated, and after different fashions, requiring no small experience before we learned to manage the peculiarities of their changed condition. Thus, dried apples become one solid breccial mass of impacted angularities, a conglomerate of sliced chalcedony. Dried peaches the same. To get these out of the barrel, or the barrel out of them, was a matter impossible. We found, after many trials, that the shortest and best plan was to cut up both fruit and barrel by re-

peated blows, with a heavy axe, taking the lumps below to thaw. A crow-bar, with chiselled edge, extracted the *laminæ* badly; but it was, perhaps, the best thing we could resort to.

Sugar formed a very funny compound. Take *q. s.* of cork raspings and incorporate therewith another *q. s.* of liquid gutta percha or caoutchouc, and allow to harden; this extemporaneous formula will give you the brown sugar of our winter cruise. Extract with the saw; nothing but the saw will suit. Butter and lard, less changed, require a heavy cold chisel and mallet. Their fracture is conchoidal, with hæmatitic (iron ore pimpled) surface. Flour undergoes little change, and molasses can, at —28 deg., be half scooped, half cut, by a stiff iron ladle.

Pork and beef are rare specimens of Florentine mosaic, emulating the lost art of petrified visceral monstrosities seen at the medical schools of Bologna and Milan; crow-bar and handspike! for at —30 deg. the axe can hardly chip it. A barrel sawed in half, and kept for two days in the Caboose house at +76 deg., was still as refractory as flint a few inches below the surface. A similar bulk of lamp oil, denuded of the staves, stood like a yellow sand-stone roller for a gravel walk.

Ices for the desert come of course unbidden, in all imaginable and unimaginable variety. I have tried my inventive powers on some of them. A Roman punch, a good deal stronger than the strongest Roman ever tasted, forms readily at —20 deg. Some sugared cranberries, with a little butter and scalding water, and you have an impromptu strawberry ice. Many a time at those funny little jams, that we call in Philadelphia "parties," where the lady-hostess glides with such nicely regulated indifference through the complex machinery she had brought together, I have thought I have noticed her stolen glance of anxiety at the cooing doves, whose icy bosoms were melting into one upon the supper-table before their time. We order these things better in the Arctic. Such is the "composition and fierce quality" of our ices, that they are brought in served on the shaft of a hickory broom; a transfixing rod, which we use as a stirrer first and a fork afterward. So hard is this terminating cylinder of ice that it might serve as a truncheon to knock down an ox. The only difficulty is in the processes that follow. It is the work of time and energy to impress it with the carving knife, and you must handle your spoon deftly, or it fastens to your tongue. One of our mess was tempted the other day by the crystal transparency of an icicle to break it in his mouth. One piece froze to his tongue, and two others to his lips, and each carried off the skin: the thermometer was at —28 deg."

The behaviour of Fermentation and Putrefaction in Filtered Air. By Schroder and Dusch.—According to the researches of Schwan, which have excited great attention, the microscopic germs of fermentation, fungi, and infusoria, are the agents which develope fermentation and putrefaction:

and consequently, if the air is heated to redness, which conveys these germs, the above phenomena cannot take place. The authors have filtered air through cotton wool, which air they have tested by allowing it to pass over substances which readily ferment or putrefy, and have arrived at the following conclusions:—1. That the filtered air will not putrefy flesh recently boiled with water. 2. That broth will remain many weeks unchanged in this air. 3. That the sweet wort from malt will remain unaltered for a week, and not undergo fermentation. On the contrary, the coagulation of milk goes on as rapidly in filtered air as in that which is not filtered. Flesh, which probably was not sufficiently heated before the experiment, putrefied in filtered air. The authors would draw also from their experiments the conclusions that there is a spontaneous decomposition, for which oxygen only is necessary, and which causes the putrefaction of flesh without water, and that of the caseine of milk, which converts the sugar of milk into lactic acid, but that the fermentation of malt wort, &c., does not belong to this category, as to effect this result some organic admixture of the air is necessary, which can be removed by a filteration or a red heat. —*Ann. of Pharm. from Annalen der Chemie.*

On forming vessels of gold by the aid of phosphorus.—The property of phosphorus, of precipitating certain metals from their solution has long been known; and gold is among the number. M. Levol has used this process in forming gold vessels useful in chemical research. He takes the perchlorid of gold, and places in it, at the ordinary temperature, some phosphorus, moulded of a form convenient to serve as a nucleus for the vessel of gold. To give the phosphorus the desired shape, it is melted in a water-bath near 60°C. in temperature, within a vessel of glass having the form required. After cooling it, the phosphorus is taken out solid, from its envelop, breaking it, if it be necessary. The precipitation of the gold or the construction of the vessel is then begun; and it finally remains only to remove the phosphorus by re-melting it and washing by the aid of boiling nitric acid until the last traces are removed.—*Silliman's Journal.*

Gilding of Silk, &c.—Commerce has furnished for some time a kind of silk treated by a galvanoplastic method; the threads produce a costly fabric of wonderful solidity. The author of the process is M. Pouilly. He first metallises the silk, then covers it with a thin layer of copper and finally applies the gold by the aid of the galvanic battery.—*Ibid.*

Editorial Department.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The following circular, issued by the Executive Committee of the Association, is reprinted here to give a wider circulation to the official invitation. The gentlemen to whom packages of the circulars have been sent in various places South, West, and North, will oblige the Committee by distributing them as *usefully* as possible. Before our next number the meeting will have taken place, and we hope to be able to give an account of its proceedings.

CIRCULAR ADDRESS

To the Pharmaceutists and Druggists of the United States.

By a resolution of the American Pharmaceutical Association in August last, the Executive Committee were directed to circulate an address to Apothecaries and Druggists throughout the United States. In pursuance of this duty, the Committee first present the official announcement of the meeting by the President, viz.:

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Annual Meeting of the American Pharmaceutical Association will be holden in the City of Cincinnati on the last Tuesday [25th] of July next, at 11 o'clock, A. M.

The object of the Association being the advancement of Pharmacy in the United States, it is desirable that a general interest in its favor should be created among the Pharmaceutists and Druggists According to the requirement of the Constitution, the following conditions of membership are published, and an invitation is hereby extended to all who are eligible to membership, and who feel an interest in the Association, to attend the ensuing meeting.

Boston, May, 1854. WM. A. BREWER, President.

Extracts from the Constitution of the American Pharmaceutical Association.

"SECT. II, *Art* 1.—All pharmaceutists and druggists who shall have attained the age of twenty-one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association, are willing to subscribe to them, shall be eligible for membership.

"SECT. II. *Art.* 2.—The members shall consist of delegates from regularly constituted Colleges of Pharmacy and Pharmaceutical Societies, who shall present properly authorised credentials, and of other reputable pharmaceutists feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such delegates are present at the Association, they may, on obtaining the certificates of any three members of the Association, be admitted, provided they be introduced by the Committee on Credentials.

"SECT. II. *Art.* 5.—Every local Pharmaceutical Association shall be entitled to five delegates."

The objects aimed at in the establishment of the Association are so full of interest to apothecaries and druggists, that every member of our profession is interested in its success. These objects are mainly *the improvement of the practice of Pharmacy*, and the elevation of the *professional character* and *qualifications* of its practitioners. To effect these desirable objects the Association has encouraged the measures adopted by government to prevent the importation of adulterated and inferior drugs; has advocated a spirit of self-improvement among existing apothecaries and druggists;

and has urged the adoption of efficient means of pharmaceutical education for the rising generation. By raising the standing and qualifications of the present race of pharmaceutists, physicians will be much better served, the community at large benefited, and the apothecaries themselves will reap a greater pecuniary reward, inasmuch as their valuable services will command higher recompense.

The great subject of providing more efficient means of instruction by public institutions, and at home in the shop and laboratory, has claimed earnest attention, and was referred to a special committee last year, to report in July at Cincinnati. As the future progress of Pharmacy in this country will be materially affected by the systematic education of the present minors, it is of the first importance that those now in business should adopt a liberal spirit, and aim at making their pupils and assistants better apothecaries and druggists than themselves.

The Association looks towards the local organization of pharmaceutists as a powerful means of effecting the reforms it aims at producing Without co-operation nothing can be done; with it, every desirable reform may be carried out. Among the pharmaceutical ranks there is ample occasion for the display of brotherly feeling and charity—the best educated have room to improve;—the most meagerly instructed may raise their status greatly; and it wants but the infusion of more liberality of feeling, the silencing of the demon of jealousy, and a less bitter spirit of competition in business, to produce changes as useful to the members of our profession as they will prove salutary to the best interests of the community who are served.

It is with earnest sincerity, therefore, that we urge on our pharmaceutical brethren of the United States that they should openly recognise among their friends at home, the efforts making by the Association, and, when practicable, to attend its meetings and participate in its labors. The migratory character of the annual meetings affords an opportunity to a much larger number than would be the case if they were fixed at any centre; and in reference to the present meeting in the largest city of the Mississippi valley, the centre of a circle of human enterprize, we hope our western and south-western brethren will manifest a large share of interest, by making some sacrifices to attend its sessions.

The Corresponding Secretary, Dr. William B. Chapman, corner of Sixth and Vine Sts., Cincinnati, will give information of the place of meeting.

William Procter, Jr.,
Thomas B. Merrick,
Joseph Laidley,
} *Executive Committee.*

Philadelphia, June 6th, 1854.

St. Louis Medical Society vs. the Apothecaries.—The following document issued by the St. Louis Medical Society, was sent to us by one of the parties addressed.

"At a regular meeting of the St. Louis Medical Society, held April 8th, 1854, the following Preamble and Resolutions, were adopted:

Whereas, Druggists in St. Louis, are in the habit of RE-FILLING prescriptions without any assurance that it is authorized by the physician prescribing; and, whereas, druggists are in the habit of prescribing for, and administering medicines to individuals who choose to consult them; therefore,

Resolved, That the apothecary has no just right to put up a prescription the SECOND time, unless authorised in writing by the physician prescribing.

Nor has said apothecary any right to make use of said prescription in any way, unless by the consent of the physician.

Resolved, That in case this Society can be positively assured of the violation of the foregoing resolution, we pledge ourselves to withhold our influence from any druggist who may thus act, and we will use other means to make such conduct public.

Resolved, That we withhold our support from all apothecaries who persist in the reprehensible practice of prescribing for diseases.

Resolved, That the Secretary of this Society, furnish every retail druggist in the city with a copy of these Resolutions."

The course adopted by the Medical Society to remedy the evils complained of, appears to have given umbrage to many of the apothecaries of St. Louis, and some of them, in their individual capacity, have availed themselves of the columns of the daily press to bring the matter before the public in a way not calculated to promote good feeling between physicians and apothecaries.

There are some points in the resolutions that deserve notice. In the first place, the Society, in issuing such a paper, should have appended the names of the officers, or given some attest of its genuineness, else it might be construed to be the work of some mischievous person.

The ground taken in the first resolution, "that the apothecary has no *right* to put up a prescription the second time unless authorised in writing by the prescriber," is not only not held out by the usual practice in England, whence most of our customs are derived, but we believe if such a law was promulgated by medical societies their own members would be among the first to break it, as it as convenient as usual for the physician to verbally direct the nurse or patient to have a prescription renewed. It has become the custom here among apothecaries to retain the original prescription, but in England it is quite common to return the original to the purchaser or patient enclosed in a stamped envelope. It is a part of medico-pharmaceutical ethics yet to be settled by general consent, how far the patient who pays for the prescription is entitled to it. Some physicians have assumed that the fee covers only the application, or the right to use the prescription at the time it is given; and such it would appear is the opinion of the St. Louis Medical Society. Others take a more liberal view and leave the matter entirely to the patient, trusting to the influence of good sense to regulate it.

There are cases where the undue renewal of a prescription should be avoided when known to the apothecary; as, for instance, where A. tells B. that certain medicine prescribed by Dr. C. for her child, certainly will cure B.'s child, on the mere supposition that the cases are similar; besides, it is an injustice to the family physician of B. who, if the child is too sick for legitimate domestic treatment, should be consulted.

The second resolution is not put forth in a spirit to do any good; it is too threatening in its character for a western city, where men of all classes are less controlled by custom and chartered privilege than in the older cities.

The practice of prescribing for diseases in general by apothecaries is certainly highly reprehensible, and deserves the rebuke of the third resolution when carried beyond the ordinary information regarding doses and minor complaints about which it is unusual to consult physicians. Prescribing is not the province of the pharmaceutist, and in doing it he is constantly liable to do mischief to the patient and injustice to the physician, who is not only thus deprived of his proper employment, but is too often called in after cases have become less curable by delay. Yet knowing the constant temptation to prescribe, owing to public importunity, especially from the lower classes, it is not surprising that much of it is done. We trust our brethren of St. Louis are not disposed to overstep the bounds of their profession, but are desirous of rendering efficient aid as co-laborers with the physician, and we should be sorry to see them by any ill advised measures of their medical friends do from a spirit of opposition what we believe is now done in a great measure from the force of circumstances.

St. Louis Pharmaceutical Association.—It is with pleasure that we announce the organization of a pharmaceutical society in the city of St. Louis, By a letter from Mr. Alexander Leitch, we are informed that the pharmaceutists of that city met on the 25th of May, 1854, and determined to form an association "for the purpose of exciting a more generous and brotherly feeling among the members of the profession of pharmacy," that they may co-operate in carrying out measures for the advancement of pharmacy and the improvement of the educational status of the apothecaries and druggists. The following gentleman were elected officers of the association, viz:

President, ...	J. E. Jones.
Vice-Presidents, ...	William L. Maddox.
	T. L. Rives.
Treasurer, ...	H. T. Platt
Recording Secretary, . . .	H. G. Wade.
Corresponding Secretary, . .	Alexander Leitch.

We hope that five delegates from this new organization will be timely appointed, that they may be welcomed by the representatives of older societies at the Cincinnati meeting.

"Old Physic and Young Pharmacy," or "a few words with the Apothecary."—The following remarks, under the above caption, in the May number of the New Jersey Medical Reporter, are from the pen of the associate Editor.

"The noise and show of quackery, in these days of patent Elixirs and Cure-alls, seem to have ensnared our friends of the mortar—and we have a few words for them. We hope they will take our counsel kindly, for though our prescription may be difficult to compound, and still more difficult to take, we feel assured that it is a good one. We do not pretend to assert that physicians themselves are just what they ought to be; but still we believe,

they generally observe a proper etiquette towards their brethren of Pharmacy. Let us examine our mutual relation for a few moments.

Apothecaries want to sell quack medicines. Doctors say it is a breach of fidelity, and an injury to society. Early in the history of medicine in this country, the Doctor's shop was the great central point, where medicine was prescribed, and procured. It was not the fashion then, to write prescriptions, but to prepare the medicine, and administer it to the patient; but as the sun broke out from its early dawn, and began to raise higher and higher, shedding light upon the advancing world of mind, the doctor began to think that there were two reasons why he should *confer* upon others the office of preparing medicine, and the advantages resulting from it. Chemistry whispered to him, in his musings, that she had been silently busy in the bowels of the earth, and in the waters of the great deep, and had discovered some wonderful things. He gave his assent, and bid her bring them out. She had a strong brother,—Pharmacy by name,—who came to his other ear, and whispered strange and very doubtful truths, about extracts, confections, and various novelties, before untold, and unknown. To this, Old Physic gave his nod of assent, 'evacuated the principalities' demanded of him, in a far more amiable mood than is exhibited by the Czar of Russia, and yielded the territory to the young conqueror quietly, both agreeing to aid each other, in the great work of healing. In good faith, both go on. Year rolls up against year; and as the steep of time becomes more and more rugged, they yet hold together, and in mature, vigorous manhood, are accomplishing more—far more, than they could have anticipated, when the *intervening* quack, without a crown of royalty to deck his brow, or a star of republicanism to enlighten his path, but with the iron step of a haughty usurper, comes in to sever the bond that had united the old man, with his adopted child. Now, what is the issue. The child, fired with the spirit of 'Young America'—instead of holding on in good faith, to good old custom, attaches himself to the train of the usurper, and begins to shout with the multitude that follow on in his dusty train. Quack medicines must be sold, and I will sell them. They must be sold, because they will be bought, and I will have the buyers. This is the logic—it is the logic of the day—and young Pharmacy dresses himself up in gold and glitter, shows himself at the corners of the streets, in significant characters, his pockets, 'drawers' and all, stored with the spoils of the aggressor, and offers them to the passing crowd.

He has left his first estate. He has become a caterer to a morbid moral taste,—a taste for the unreal. He must live,—this is the reason. He is not the author of the morbid desire for quackery. But, to accommodate the public, he will supply the demand created by it, as the jeweller supplies useless trifles, and trinkets, which are equally the creatures of an idle and corrupt taste. But where is Old Physic now? He is still in the line of his duty. He has kept to his contract. He does not sell even the medicine he has prescribed. Not because he cannot, but because he has said, *bona fide*, he would not. He sends his prescription to the apothecary, who furnishes the medicine "carefully compounded," and neatly put up, for a consideration. All right. Is there no reciprocal consideration, due the physician under these circumstances? Young Pharmacy opines not, if its return is in any way to interfere with money getting, not bearing in mind, that the physician has forfeited all claim to this end, by refusing to dispense the medicine himself. Pharmacy is the child of Physic. It is so in a two-fold sense. First by age, and second, by patronage. The business of prescribing belongs to the Parent, that of compounding, to the child.

A physician is in attendance upon a patient. He does not recover as rap-

idly as either party could desire. But such is the nature of the case. Perhaps it is phthisis, from which he cannot recover. He wants to try Jayne's, or Swaim's, or somebody's expectorant. The doctor objects. The patient sends to the apothecary to know what is good for consumption. He is shown a bottle, on which is labelled, what the manufacturer, and vender, and consumer, all know to be a falsity—an infallible cure for an incurable malady. A dollar pays for it, and it is purchased. The patient is wronged out of his dollar, and the apothecary keeps his share, while the judgment of the physician is set at defiance. But all is forgotten when the poor sufferer dies, except the maxim, which it behooves all to remember—that the way of trade is, in many instances, the way of death. This is one difficulty. Here is another. Undue confidence is imparted to the manufacturer of quack medicine. Those who sell, indirectly sanction the whole system of quackery, and sustain a *patented* pharmacy, in opposition to their own recognized system. The physician is responsible for his prescription, it being certified by signature, and date. If it does harm, he is accountable. The apothecary, by selling a secret medicine, promising to cure, shares in the responsibility, if a cure is not effected.

Take for example, 'worm medicine.' It is a curious fact, that if a child is a little unwell, the careful mother, and knowing nurse, almost invariably diagnosticate worms. It picks its nose, loses its appetite perhaps; and a variety of other systems present themselves, till, (it being a simple case, not requiring the advice of a physician), the apothecary is consulted, and Hobensack, or Fahnestock, or some other representative of the school of patented pharmacy, is offered in the form of a vermifuge, which will eject the worms if there are any, either whole or in pieces, and if not, protect the system against them. The medicine is purchased, and administered. The bowels are actively purged, and violent disease is induced. Who is responsible? We will not answer. This is no picture. It is a *living fact* We know that a large number of cases of sickness in children, to which the physician is called, particularly in the country, unless it be some sudden illness, have been previously treated by the family for worms; and we are satisfied from no very limited experience, that these 'worm medicines,' compounded by the covetous, patented by the ignorant, sold with promises, and used by the over-credulous, are often the cause of serious mischief. Such mischief, under the treatment of a physician, would subject him to a charge of mal-practice. But as it is done, by a counterfeit, with the noise of 'sounding brass, and tinkling cymbal,' the perpetrator escapes unwhipt of justice.

We know right well, that should the profession of medicine return to the 'doctor shop' of olden time, our pharmaceutical brethren would feel like bringing their cantharides to bite at our wandering feet, and perhaps with justice. May we not say to them, that they perhaps need a gentle sedative, a cooling draught;—mixed it may be, with a moderate aperient, to carry off unwholesome deposits, that have already defiled the *body social!*

Take our prescription, and we think it will do you good. Your science is a noble one—and it is distinct. But so far as practical pharmacodynamic is concerned, leave it in the hands of the physician, and he will do you all the honor you may claim at his hands."

There is some good advice in "Old Physic's" remarks, and as it is given in a friendly spirit, we hope the brethren will profit by it; as regards "Old Physic's" opinion of his own profession, we have a few words to say, lest it should be thought that we consider it free from fault in the matter discussed. He takes the ground that "he does not sell even the medicine he has prescribed," but has handed it over to the apothecary, who

acts ungratefully toward him in not wholly abstaining from prescribing at the counter and from selling quackery. It would be well to call his attention to the fact, (Proc. Amer. Pharm. Assoc., 1853) that of 274 retail druggists in Philadelphia, 57, or one-fifth, are kept by practicing physicians, who, as they enter into competition with regular apothecaries, the latter, to compete, too often are induced to prescribe to retain their business. Add to this the immense amount of medicines dispensed by physicians in the rural districts, where apothecaries do not exist, and in villages and small towns where they do, and it must be admitted that "Old Physic," however kindly he may feel towards his offspring, has not yet become willing to trust him with the sole management and income of his pharmaceutical estate.

Iodide of Potassium and the Mercurials.—It is due to us to state that when the paper on the above subject, in our last number, was published, the author had entirely overlooked the extensive and important paper of M. Melsens, which, though written for a different object, included most of the results obtained by him.

Bronze Labels for Shop Furniture.—The Committee of the College of Pharmacy on Latin Labels have published the first edition of bronze labels, and a specimen of them may be seen in the advertising department of this number.

The relation between the atomic weights of the Chemical Elements. By Josiah P. Cook, Jr., Erving Professor of Chemistry in Harvard University. (From the Memoirs of the American Academy). Cambridge. 1854. pp. 22, quarto, with a chart.

We are indebted to Mr. Wm. A. Brewer, President of the American Pharmaceutical Association, for a copy of Mr. Cook's paper, of which the above is the title. The author appears to have given much thought to the subject and has developed some new views, but our space does not admit of entering upon an analysis of the paper for the benefit of our readers at this time.

Death of Sir James Wylie.—Many of our readers have heard of Sir James Wylie, of St. Petersburg, and chief physician to the Russian Court. A notice of him was published last year in Prof. G. B. Wood's introductory lecture at the University of Pennsylvania. Sir James Wylie was born in Scotland in 1768, was knighted at Ascot Heath Races in 1814 by George the Fourth, then Prince Regent; and subsequently, at the request of Alexander of Russia, was created a baronet of England, as he refused, though intending to reside in Russia, to give up his allegiance to the English crown.

Death of M. Roux. This eminent French surgeon died recently at Paris, aged 74. He was a cotemporary and early rival of Dupuytren.